X-Configurator

User's Manual

Manual version 1.13, August 2000

Note

The information in this manual is subject to change without notice.

This manual provides a description of the X-Configurator software. The instructions included in this manual are compatible with software version 1.2.

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Chapter 1 – System overview

1.1. What is X-Configurator?

X-Configurator is a service delivery management tool, which supports the BinTec router family. X-Configurator provides an efficient delivery model of new managed services for medium and large enterprises. Installing a router or adding new features to the remote router - like e.g. adding new WAN partners, changing CHAP passwords or configuring interfaces is fully automated and trouble free. X-Configurator automates and instantly reduces costs for the following tasks:

- MASSIVE ROLLOUT AND INSTALLATION SCENARIOS
- NEW SERVICE CREATION
- SERVICE PROFILING AND DISTRIBUTION
- DELIVERY OF UPDATES AND UPGRADES

X-Configurator is an absolutely modern and innovative platform to address the issues and complexities of installing and managing significant numbers of routers within a service provider network. X-Configurator enables the service provider to offer and maintain new services at low rates and high availability.

X-Configurator was developed to meet the following customer and devices needs:

- fully automated provisioning and maintenance of remote devices
- no on site engineer required to provision the device
- no end user configuration required to enable network access
- the migration to different service-levels should be supported as a seamless operation
- experts should only be involved during the service definition phase
- investment protection
- the device automatically gets only what is necessary for update - configuration or image
- a single change updates all devices that subscribe to a particular service
- no pre-configuration of device required - units will be shipped directly from stock

1.2. Components

X-Configurator system consists of the following components:

- XACS Server
  - XACS Scheduler
  - IPC Service
  - Database Trigger
- WEB Server
  - Apache WEB Server with PHP
- Oracle 8i Database
- TFTP Server
- Radius Server (optional)

- Configuration router
- Firewall
- WEB console and X-Configurator users

XACS Server and TFTP Server are services that must be running under Windows NT 4.0. Currently WEB Console can be browsed and managed using Internet Explorer 5.0 but in the future will support Netscape Navigator, too.

1.3. System operation summary

X-Configurator uses task template, target (client) and job. Task template is the entity which tells "what", "when" and "for whom" should be done. Task template groups together the following information:

- List of targets to service
- List of target groups to service
- Identifier of the action (job) to perform
- Start task conditions

Task template (task) stores both target and target groups information. Only one action can be defined for a task. This might seem to be a strong limitation, but it is not in fact. Since actions in the system are written as scripts, you can group things to be done in script including many files in one. Having only one action (job) per task allows avoiding unnecessary redundancy.

The action to perform in task template is defined by job. The job is a script written in LUA programming language. X-Configurator embeds LUA, extended with communications functions: ISDN connection establishment and termination, and data exchange. Task template has a list of targets associated with it. When a task is started, the job is performed for all targets associated with task template. The target is defined by number of parameters, including its name, phone number, IP address, netmask, etc. All these parameters can be referred to by job.

Having task template defined and activated, scheduler checks if start conditions have been met. If yes, it creates task instance referred also as session. One session is created for every target in task template. Session has status field, which keeps track of session execution state. This field is updated by XACS Scheduler. Session can be repeated automatically by XACS Scheduler in case of a failure.

Task template can be started in two ways:

- Outbound – central site (X-Configurator) initiate a call
- Inbound – remote device initiate a call

1.4. Meaning of Task Templates

Task templates are defined in Projects option of X-Configurator. Task templates define static of the system. Task templates groups together the following information:

- List of targets or/and target groups
- Job, which has to be run for all those targets
- Start conditions

Dynamic of the system is represented by tasks instances and sessions. Sessions represent script execution for a single target. When task start conditions are fulfilled, task template is triggered – e.g. task instance is created.

1.5. Meaning of Jobs

Job is a script written in LUA programming language. X-Configurator embeds LUA, extended with communications functions: ISDN connection establishment and termination, and data exchange. Actual job (script) is stored in file. You can use either plain-text script files, or compile the file to binary – to hide source code.

1.6. Meaning of Targets

The target means remote router. In fact, this can be any device, which provides X.75 connectivity. X-Configurator stores targets definition in database. Targets may have many parameters, which are dynamically created by the user in X-Configurator.

1.7. Meaning of Projects

Project is a set of task templates, jobs and targets. It contains all necessary information about installation and configuration process. The X-Configurator realizes the control, modifications and user's identification in each project. In order to access project data, user has to log in to the system. Every type of user (Administrator, Project-Manager, Operator, Hotline, End-User) is given a set of rights which state his privileges in entire X-Configurator. The rights for different types of users can be configured in section Rights of the Users option menu. By choosing different rights for different types of user you can limit rights of some users to only viewing the appropriate data from the project, others to modifying data and others to having full access to the entire system.

1.8. Meaning of Setup option

Global parameters required by X-Configurator are defined in Setup option of X-Configurator. See the description for Setup menu option for details.

1.9. Meaning of Communication Channels

X-Configurator is particularly designed to work with great number of targets. It needs information about available communications resources to schedule sessions. For example it is not reasonable to start 3000 jobs (scripts) at once (each of them trying to make ISDN connection) when only two B-channels are available. In ISDN option of X-Configurator you define resources available on the configuration router(s). The resources are represented in CAPI 2.0 fashion – in terms of controllers and channels. For example, if you use one configuration router in central site, which is standard S0 controller – with 2 B channels supported, you should create in ISDN menu option one

controller with 2 B channels and optionally mark option "Used for listening". That will allow to answer and to handle the incoming calls by X-Configurator.

1.10. Meaning of Task Instance

Task Instance - single execution of task, for all targets, which are associated with task template. Task instance consists of sessions – one or more for each target. Task instance groups together both successful and failed sessions.

1.11. Meaning of Session

Single execution of job's script for the target (client). Session has its status, i.e. indication if it has completed successfully. Session status is set in job, by assigning value to *error_code* variable. For more information about *error_codes* see XACS event codes section.

1.12. Meaning of XACS Log

XACS Log stores system log. The log is mainly used to report system errors, but can also be used to write debugging and tracing data. What is stored in log depends on the global debug level parameter defined in Setup option and in the field *Debug level* configured for each target. See Setup option to find more information about configuring the XACS Log. You can view the contents of the log by choosing XACS Log option of the X-Configurator.

1.13. Meaning of NAS

NAS is an ISDN router or other ISDN device located at central site which allows serving the targets. Since every target must belong to one NAS (which will serve them), at least one NAS must be defined for each project. You can define many NASes located at central site (if you have many central routers) and indicate, which NAS will serve particular target or targets.

Chapter 2 – XACS Scheduler

2.1. How XACS Scheduler works

Scheduler monitors database to look for tasks to activate. When task start condition is fulfilled, the XACS Scheduler creates sessions for all targets associated with given task. Initially, session is in "Initial" state. It means, that session is waiting for communications channel to become available. The XACS Scheduler also creates task instance. Task instance is the entity which bounds together all sessions originated from the same task template run. This means sessions to all targets, both successful and failed. There can be many sessions to one target in the same task instance, as failed sessions are being retried.

The XACS Scheduler keeps track of communications channels (ISDN channels) available. The administrator in ISDN option must define the available controllers and channels. When channel becomes active, it changes session state to "Running" and executes job associated with session. "Job execution" means running script here. The XACS Scheduler embeds LUA language script interpreter, extended with communications functions. The script performs its actions (typically connection establishment and data exchange), and sets variable "error_code" to indicate if it completed successfully.

When session is completed, its state is marked as "Completed". If session has completed with failure (i.e. “error_code” variable was set to value different then "0" by the script) scheduler retries the sessions. "Retrying session" means creating new session. Newly created "retry" session has "retry_count" field incremented. It shares the same instance identifier, as parent session. Retried sessions are not started immediately. Instead they are created in "Postponed" state. In this state, session is "frozen" for some time (5 minutes). After this time, session state is set to "Initial" – from this moment session can be scheduled to run. How many times session is retried, depend on *Number of retries* field of session parent task template.

Diagram below shows session lifecycle.

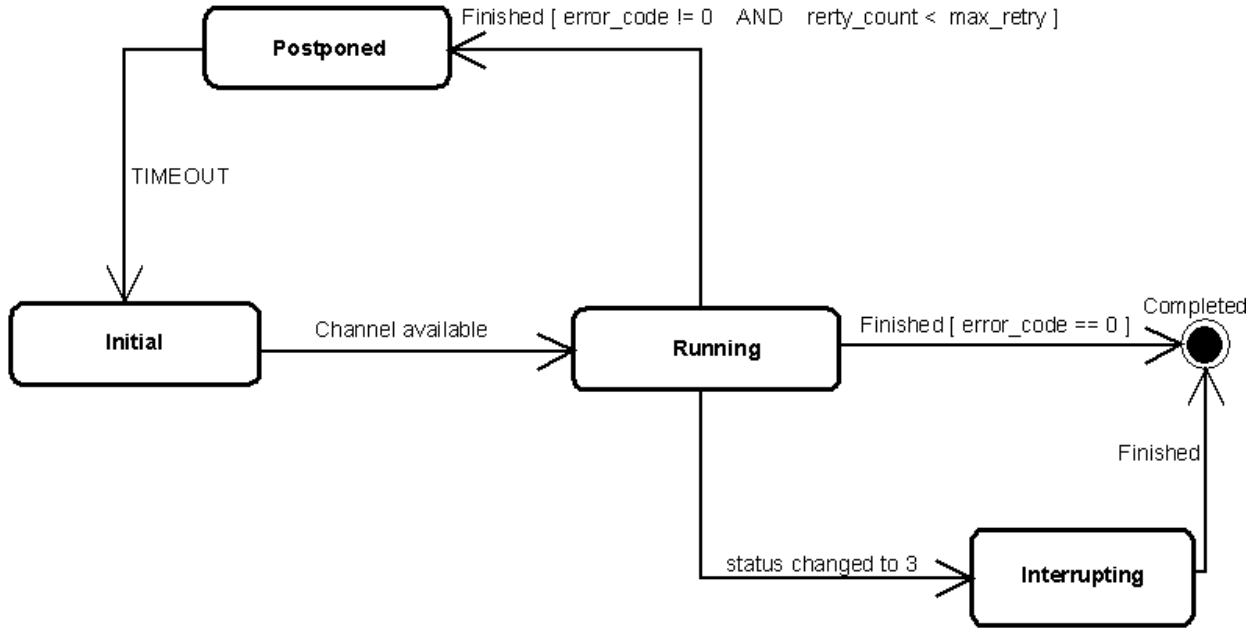


Figure 1 Session lifecycle diagram

Every time a session is completed, scheduler scans all sessions belonging to the same task instance. When all sessions are completed, task instance status is changed. If all sessions are completed with success, instance status is set to "Completed OK". If some sessions completed successfully and some failed, instance status is set to "Partially Failed". If all sessions has failed, instance status is set to "Totally Failed".
When session is running for the time longer then defined in *Task duration* field of the task template, scheduler terminates the session.

Table below describes session and task instances states:

Session State	Description
Completed	Session has finished. "error_code" describes session result. Value of "0" means success. Other values indicate error. "error_code" is set by script. Values of "error_code" are predefined (see section XACS event codes)
Initial	State for newly created session. In this state, session waits for communications channel to be available.
Running	Session has been granted communications channel, and is running script.
Interrupting	Session is being interrupted. Scheduler sets session state to this value, when it terminates session, which failed to complete within specified duration. You can also interrupt not completed session.
Postponed	First state for session, which is created as retry of failed session. The practice shows that it is good to wait some time before retrying communication session to faulty target. The session waits in this state for 5 minutes, and then is put to “Initial” state.

Task instances states and their meaning:

State	Description
Running	Task instance is running. This is initial state. Instance stays in this state as long, as not completed sessions associated with this instance exist.
Completed OK	All sessions associated with the instance completed successfully (i.e. their "error_code" is "0").
Partially Failed	All sessions associated with the instance completed. Some of then has been successful and some failed.
Totally Failed	All sessions associated with the instance completed with failure.

As session record stores information about its completion result and error text (if any), this is main source of information for the system user. View tasks instances option located in Task Templates or Task Manager option are helpful, as it stores "global" parameters: summary task instance status, and duration.

2.2. Task start conditions

Activities to be performed by X-Configurator are defined in terms of task templates. Task template basically consists of three elements: job to be done, list of targets (target groups) to service, and its start conditions.

Task template start conditions are constraints, which have to be fulfilled to start the task.

Start conditions will define "Task type". The following start types will be available:

Start Type	Description	Parameters
On Time	Starts the task at specified date and time	• Start time.
Repeatable	Starts the task on time conditions. Time conditions are like "start every Thursday, on 10 PM".	• Unix cron-like string
On Call	Starts the task, for specified target in case of incoming call.	• Rule for matching calling number (e.g. match last N digits) • Number of calling number digits to match (according to "Rule")
On Event	Starts the task when event occurs. This start type is to be used with external software.	• Event name

2.3. "On Time" Tasks

“On Time” tasks are quite simple to explain: task template is triggered, when the specified time is reached. Task instance is created, and so are the sessions to all targets associated with the task template. This does not mean that the system tries to call all targets at the same time. Targets are being called, when communications channels (e.g. B-channels) become available.

2.4. "Repeatable" Tasks

“Repeatable” tasks can be used when you want some activity to be performed repeatedly, e.g. every Thursday, on 10 PM. You will specify appropriate time conditions at creating time of the task template of this type.

2.5. "On Call" Tasks

The idea behind “On Call” task is, that user requests configuration session on its own – calling central site (NAS). The system supports two incoming calls handling strategies: CLID method and Active method.

2.5.1. CLID method

CLID method is simple: remote device makes ISDN call to the X-Configurator. The XACS Scheduler rejects the call. As this is an ISDN connection, scheduler "sees" Calling Party number. Then it searches all defined and active “On Call” tasks and looks for associated target, whose telephone number matches Calling Party number. If it finds one, the session is started.

Although CLID method looks nice and simple it has some disadvantages. When remote device is mobile, its number may change. To support such kind of remote devices, the X-Configurator provides another incoming calls handling method called "Active".

2.5.2. Active method

In Active method remote device makes ISDN call to the X-Configurator. The XACS Scheduler rejects the call. As this is ISDN connection, scheduler "sees" Calling Party number. To avoid some disadvantages described in CLID method section, in this method XACS Scheduler makes login session to calling number before it analyzes tasks. It runs the special script, which retrieves information from remote device, which can be used as unique identifier. This can be e.g. device MAC address or serial number. When this special session completes, scheduler searches "On Call" tasks, but does not look at target's "Branch ISDN login telephone number". Instead if evaluates LUA language expression, which has been returned by the job script. The expression should uniquely identify the target.

The script, which is used for “Active” incoming calls handling, is configured in Setup option of the X-Configurator. The script must set special variable called "client_selection_rule". For example, if we want to find client based on its MAC address, the script should retrieve MAC address from remote device.

2.6. "On Event" Tasks

"On Event" task requires some additional explanation. The idea is to let third-party software activate the task. Activation method should be flexible. It should allow not only task, but also target selection.

"Event" is record in "xacs_events" table. The process, which wants to activate the task, should insert row into this table. "Event_name" field of the table is the name, which is task template parameter. The XACS Scheduler watches "xacs_events" table. If the entry is inserted there, it searches all task templates of "On Event" start type to find matching "event_name".

The task can contain more than one target. Using this method, we can specify exactly for what target, the task should be activated when the event occurs. E.g. if we want to activate the targets, whose geographical location contains word "Hamburg", we will input the following in the *Client selection rule* field of the task template:

"strfind(location, "Hamburg") ~= nil"

If we want to activate the target, which branch is "007", the conditions will be even simpler:

"branch=="007"

The following operations can be done on task template:

Activate	Makes the task active, i.e. "visible" to scheduler. Task will be executed when its running conditions are fulfilled.
Deactivate	Makes task template inactive i.e. not scheduled.
Run immediately	This runs the task immediately.

Any task template, no matter what its start type is, can be started on user request by choosing "Run now" option for the appropriate task template.

Task template includes job. This job specifies identifier to the action to perform.

Storing action script in file has a drawback – scripts must be located on local drive accessible for the XACS Scheduler service. Keeping scripts in file, it will also be easier to work with compiled (binary) scripts.

Chapter 3 – XACS LUA

3.1. XACS LUA Extensions

X-Configurator uses LUA programming language interpreter as embedded script language. It is beyond scope of this reference to describe LUA language itself – refer to LUA documentation for language description. In short terms, LUA is dynamically typed scripting language with syntax similar to Pascal.

X-Configurator extends LUA to support communications functions.

3.2. XACS functions

com_accept()

Accepts incoming call. ***com_listen*** must be issued first.

Returns:
0 - failure
1 - call accepted

---

com_reject(number)

Reject/ignore incoming call. This can be used, after ***com_listen*** completes successfully to ignore or reject incoming call. In cause of ISDN device, *number* specifies *Reject* value of CONNECT_RESP message. The values can be:
Value 0 should not be used – to accept the call the use should use ***com_accept*** function.
Main purpose of this function is to ignore calls, which are addressed to MSN other than application's MSN.

Returns:
0 - failure
1 - call rejected

---

com_connect(string)

Calls *string*. Returns when connection is established, or failed.

Returns:
1 - connection established
0 - error

---

com_disconnect()

Terminates connection.

Returns:
1 - connection terminated

0 - error

---

com_isdn_lastcause()

Returns 3 numbers:
- ISDN reason code
- ISDN result
- ISDN extended info

---

com_lasterror()

Returns device-specific error code.
For ISDN, error codes are:
0 - OK
1 - DISCONNECT_IND
2 - CAPI_SET_SIGNAL error
3 - DISCONNECTED
4 - Protocol error
5 - Wrong parameters
7 - Timeout
8 - CAPI_REGISTER error
9 - CAPI command error
1 Local disconnection
1 DISCONNECT_B3_IND
1 Wrong state
1 CAPI not installed
2 Call rejected
2 No memory

---

com_listen()

Listens to incoming call.

Returns number:
1 - incoming call
2 - error

com_accept should be called to accept the call. Incoming call can be rejected with ***com_disconnect***.

---

com_readtimeout()

Returns number:
0 - last receive operation completed without timeout
1 - last receive operation completed with timeout

This function shall be called when ***com_receive*** or ***com_receivebuf*** complete, to check out if timeout has occurred.

---

com_receive(delimiterstring, timeout)

Receives data until *delimiterstring* is received, or *timeout* occurs.
timeout is given in miliseconds.

Returns string of received data and received data length.
E.g. to accept line of text, with 1 second timeout, call:
readdata, length = com_receive("\n", 1000)

---

com_receivebuf(number, timeout)

Receives incoming data, until *number* of characters is received, or *timeout* elapses.
timeout is in ms.

Returns string of received data and received data length.

---

com_receiveline()

Receives incoming data, until newline character (0x0A) is received.

Returns string of received data and received data length.

---

com_send(string)

Sends *string*.

Returns number:
1 - successfully sent.
0 - send failed

Binary data can be sent using ***hex2str*** function.

---

com_sendfile(local [, remote])

Send file using Z-modem. *remote* parameter is optional. If not specified, remote file name is the same as *local*.

Returns number:
1 – file sent
0 – send error

---

com_receive_file(remote, local)

Starts receiving file using Z-modem protocol.

Returns number:
1 – file received
0 – receive error

---

hex2str(string)

Converts parameter *string* to sequence of bytes. Returns LUA string, which can contains '\0' characters. It can be used to send non-ascii characters, e.g.:

com_send(hex2str("0D0A"))

---

include_file(string)

Runs LUA file specified in parameter *string*. It does the same as LUA native ***do_file*** function, but searches XACS job script path to find requested file.

---

system(string)

Runs program specified by *string*. Actually, this calls C-language ***system*** function.

---

write_dbg(string)

Sends *string* to X-Configurator debug output. Debug output can be viewed with ctrld.exe program. Although scripts can also write XACS Log (database) this is preferred way to do debug printouts. This is because it is much faster, and overloads database.

---

write_log(EventCode, Severity, Message, DebugLevel)

This function writes to XACS Log. The parameters are:

- *EventCode*: valid XACS event code. Event codes are listed in XACS Event Codes section
- *Severity*: event severity. The values are:
  - 0: info
  - 1: warning
  - 2: error
  - 3: fatal error
- *Message*: optional text to be written to log
- *DebugLevel*: message debug level

3.3. XACS variables

Below, XACS LUA predefined variables are listed. The variables defined for devices other then ISDN are not listed here.

ARGC

This is an integer variable, equal to number of script command line options. This will always be at least "1", as first argument the script receives is its file name.

ARGV

This is an array storing script command line options. Remember, that in Lua arrays indexing starts with "1" (not "0", as in C language). First element of this array is script file name.
This is sample code that lists script command line parameters:

```
i = 1
while ( i <= ARGC ) do
write( "Argument number "..format( "%d", i )..." is:"..ARGV[i].."\n" )
i=i+1;
```

end

---

com_CIPMask

ISDN CIP Mask.

---

com_CIPValue

ISDN CIP Value.

---

com_ISDN_B1

ISDN B1 protocol.

---

com_ISDN_B2

ISDN B2 protocol.

---

com_ISDN_B3

ISDN B3 protocol

---

com_ISDN_Calling_Number

Calling number. You may have to set this variable, when making calls through PABX systems.

---

com_ISDN_ctrl_connect

Number of ISDN controller for outgoing calls.

---

com_ISDN_ctrl_listen

Number of ISDN controller for incoming calls.

---

com_device

Communications device type. The following types are defined:
- XCOM_ISDN_Device,
- XCOM_TCP_Device,
- XCOM_Modem,
- XCOM_NULL_Modem

The variables listed above, are predefined "global" variables. These variables can be read and written by LUA job script.

Chapter 4 – Configuration scripts development guidelines

The X-Configurator uses embedded LUA language interpreter for configuration scripts (jobs). The X-Configurator can write any valid LUA script, there are however some rules that must be followed to write the proper XACS configuration script.

The script is supplied by XACS Scheduler with set of pre-defined variables. These are:

- Extension variables described in XACS Variables section.
- Static parameter of target, NAS and project. These are:
  - project identifier
  - NAS identifier
  - target identifier
  - target name
  - target debug level.
- All dynamic parameters of target. Some of these parameters are used are used by the XACS Scheduler. These are:
  - *use_default_login* - This variable tells the scheduler whether to use target's own or default user/password for ISDN login. Script should set this flag to "Disable" (0) when it changes targets login parameters and set it to "Enable" (1) when is restores login defaults at target device.
- All dynamic parameters of NAS.
- *auto_login_name* and *auto_login_password*: The script should use these variables instead of *login_name* and *login_password* from target parameters. These variables are automatically set by the XACS Scheduler to target's values of defaults, according to *use_default_login* flag.

The script should use command line options for customizing. Especially, it should support write its info when run with "-?" option. To access script command line you can use ARGC and ARGV variables. You can also use ***GetParameters*** function from "comutils.lua" module shipped with the X-Configurator.

The script should set the variable *error_code* to its exit code. This is very important, as it tells the scheduler whether it should retry session. *error_code* should be set to one of predefined values for exit code. These values are listed in XACS Event Codes section. You can use symbolic names of event codes, if you include *xacs.lua* file. The scheduler does not make ISDN connections for the script. To establish and terminate ISDN connection, the script should call ***com_connect()*** and ***com_disconnect()*** functions respectively.

Chapter 5 – Preparing system for working

5.1. Installing Remote CAPI for BinTec routers

Before you start using the X-Configurator you must install Remote CAPI. For BinTec routers Remote CAPI can be installed and configured by the software called BRICKWARE supplied on CD-ROM with the router. Please refer to the documentation of the product to properly install the Remote CAPI. After installing Remote CAPI you must change properties for XACS Scheduler service. To do this, select Services from Control Panel window and then from the services list select XACS Scheduler and press Startup button. Set up “Log On As” option to “This Account”. Now enter appropriate account name and password. Now log on as a different user if necessary and restart XACS Scheduler service. To check if the remote CAPI is properly loaded, enter command "netstat -a" from command line. This command will return a list of active connections. The following item indicate that Remote CAPI is properly loaded:

TCP *computer_name*:*port_number IP_address_of_CAPI_SERVER*:*CAPI_port_number ESTABLISHED*

Where:

computer_name - is the name of the computer where the XACS Scheduler service is installed

port_number - is the port number used for communication

IP_address_of_CAPI_SERVER - IP address of the device where Remote CAPI is served (usually IP address of the BinTec router located in the central site)

CAPI_port_number - port number for Remote CAPI server

If you can't see such item on the list of active connection please refer to the documentation of your router.

5.2. Configuring ISDN channels for using by X-Configurator

In this step you will configure controller(s) used for the configuration purposes. From the main menu option choose ISDN and then Controllers. Click on **Add** to add new controller. As *Controller identifier* input unique number for this controller and in *Number of channels* input number of B-channels, which you can use simultaneously. For example, if your router is connected to the ISDN BRI, you can use 2 B-channels, if router is connected to ISDN PRI there are 30 B-channels available for you. Mark *Used for listening* option to allow the controller to answer incoming calls from the targets. If this option is "off" then X-Configurator can only dial-out and cannot serve incoming calls. Once controller is added in ISDN option then choose MSN option. Now you can add new MSN number for the previously added controller. In *MSN to listen for incoming calls* field input MSN number that allows the X-Configurator answer the calls. See description for ISDN option of the X-Configurator for more information.

5.3. Configuring Setup option of X-Configurator

Before you start using the X-Configurator you have to configure some global data. This is made in Setup option of the X-Configurator. For more information please refer to the description of this X-Configurator's option.

5.4. Creating accounts for the X-Configurator users

You will need to create users that will be able to operate in the X-Configurator. You will find more information about how to create new user and how to assign appropriate user's rights in the description of Users option of the X-Configurator. You should configure at least one user (Administrator) with full access to entire X-Configurator.

5.5. Create the new project for configuring targets

5.5.1. Create the New Project

Project is a set of task templates, jobs and targets. It contains all necessary information about installation and configuration process. The X-Configurator realizes the control, modifications and user's identification in each project. In order to access project data, user has to log in to the system. Every type of user (Administrator, Project-Manager, Operator, Hotline, End-User) is given a set of rights which state his privileges in entire X-Configurator. The rights for different types of users can be configured in section Rights of the Users option menu. By choosing different rights for different types of user you can limit rights of some users to only viewing the appropriate data from the project, others to modifying data and others to having full access to the entire system.

You can create the new project in Project option of the X-Configurator. In the *New project name* field enter the appropriate name for the new created project. Then click **Create project** to write changes into the database. Now, in the window displaying project list you will be able to see the name of the created project. Click on this project to setup its properties. The following steps can only be executed after selecting this project (must apply to this project).

Note:
When the currently logged user creates a new project he automatically gains full rights to this project.

5.5.2. Create and add new Target to Project

Choose Targets option from appropriate Project, and then create the new NAS. In the *New NAS name* field enter required name for the NAS and click on the **Add new NAS**. The new NAS will be added to the database. Note that for each project must be at least one NAS defined. Once you have added new NAS, this item appears in the registered NASes list. In the next step you must add the target (router) to the NAS. Click

on the appropriate NAS name and then **Add new target**. Once you have added the target, you can set up parameters for this target. See section Add new target and Add parameter for target for information about configuring the target.

Note:
Each target has to belong to one NAS.

5.5.2. Create new Job

Once you have added target(s) to the Project as it is described above, you can define what should be done for this target(s). See the description for Jobs option of X-Configurator for more information.

5.5.3. Create new Task Template and assign the Target(s)

Once you have created target and job as described in previous sections, the next step will define task template containing created job. You will learn how to create and configure the new task template in Task templates section. Once you assign the job, you must assign the target(s) for this task template. Additionally you can include the target groups to the task template. You will learn how to add targets to the task template in Add targets section and how to add Target Groups in Add target group section. Finally you have to make this task visible for the XACS Scheduler. Now you have to activate the task template. For tests purposes you can run the task to start configuring the target(s). You will find information from task execution in the XACS Log and in View task instances. Additionally you can use Task Manager option to check the system activity.

5.5.4. Watch the X-Configurator state

You can view the system state in the following ways:

- in Task Manager option located in Projects, to see the task activity matrix and the current system state
- in XACS Log option located in Projects, to view the log from entire X-Configurator. By choosing this option you can use filters to extract interested portion of log.
- in the View task instances you can see the log from sessions and messages from the XACS Log for the selected task.

Chapter 6 – Menu options

Figure 2 shows the main menu of X-Configurator. On the left there is the menu with options that can be selected. All these menu options are described in the following chapter. Note that such view appears only when logged user has “Admin” user right and therefore has access to the all menu options of X-Configurator.

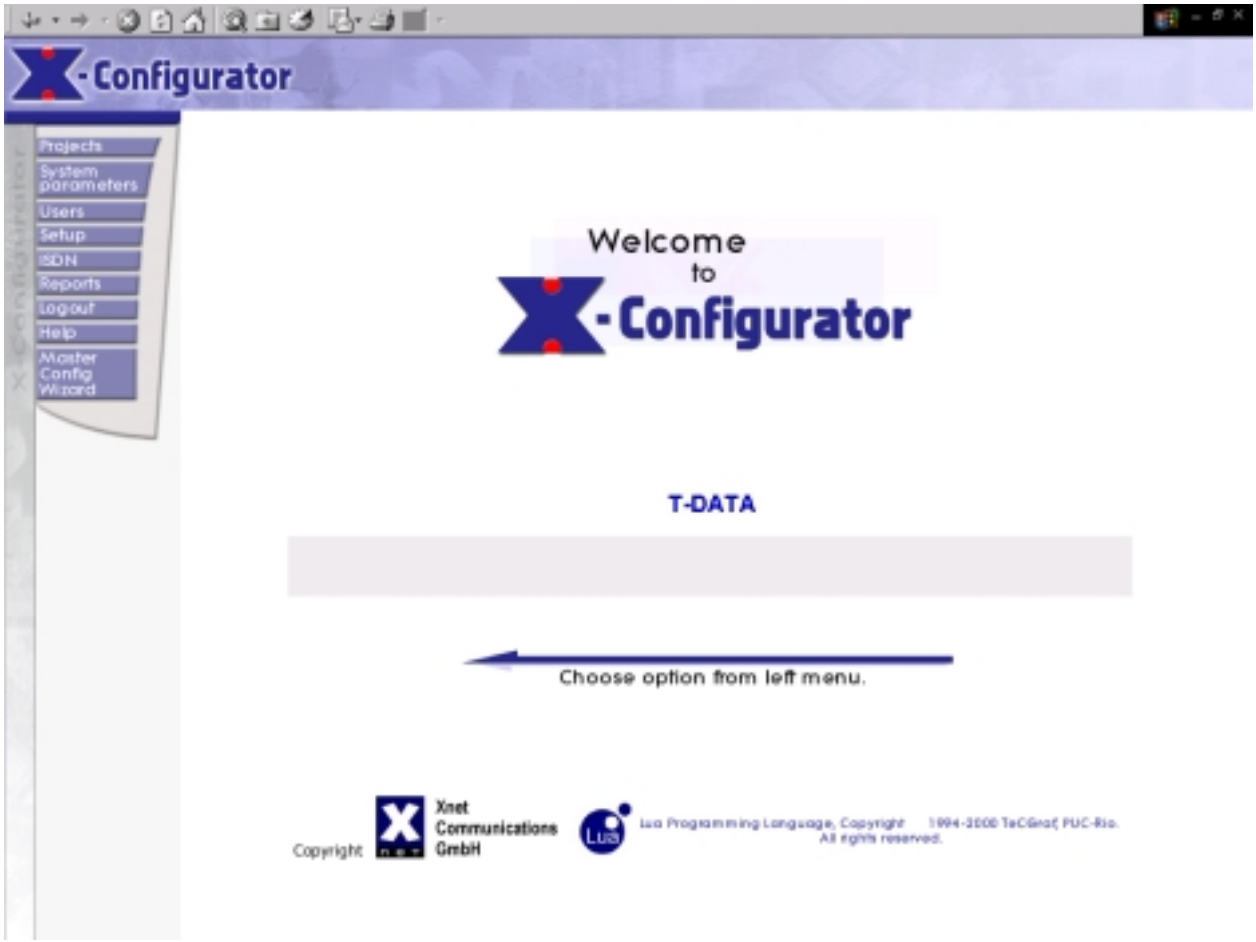


Figure 2 Main menu of X-Configurator (user logged with “Admin“ user’s rights)

6.1. Projects

Project is a set of task templates, jobs and targets (clients). It contains all necessary information about installation and configuration process. The X-Configurator realizes the control, modifications and user’s identification in each project. In order to access project data, user has to log in to the system. Every type of user (Administrator, Project-Manager, Operator, Hotline, End-User) is given a set of rights which state his privileges in entire X-Configurator. The rights for different types of users can be configured in section Rights of the Users option menu. By choosing different rights for different types of user you can limit rights of some users to only viewing the appropriate data from the project, others to modifying data and others to having full access to the entire system. Figure 3 shows the view that appears when you select Project option of X-Configurator.

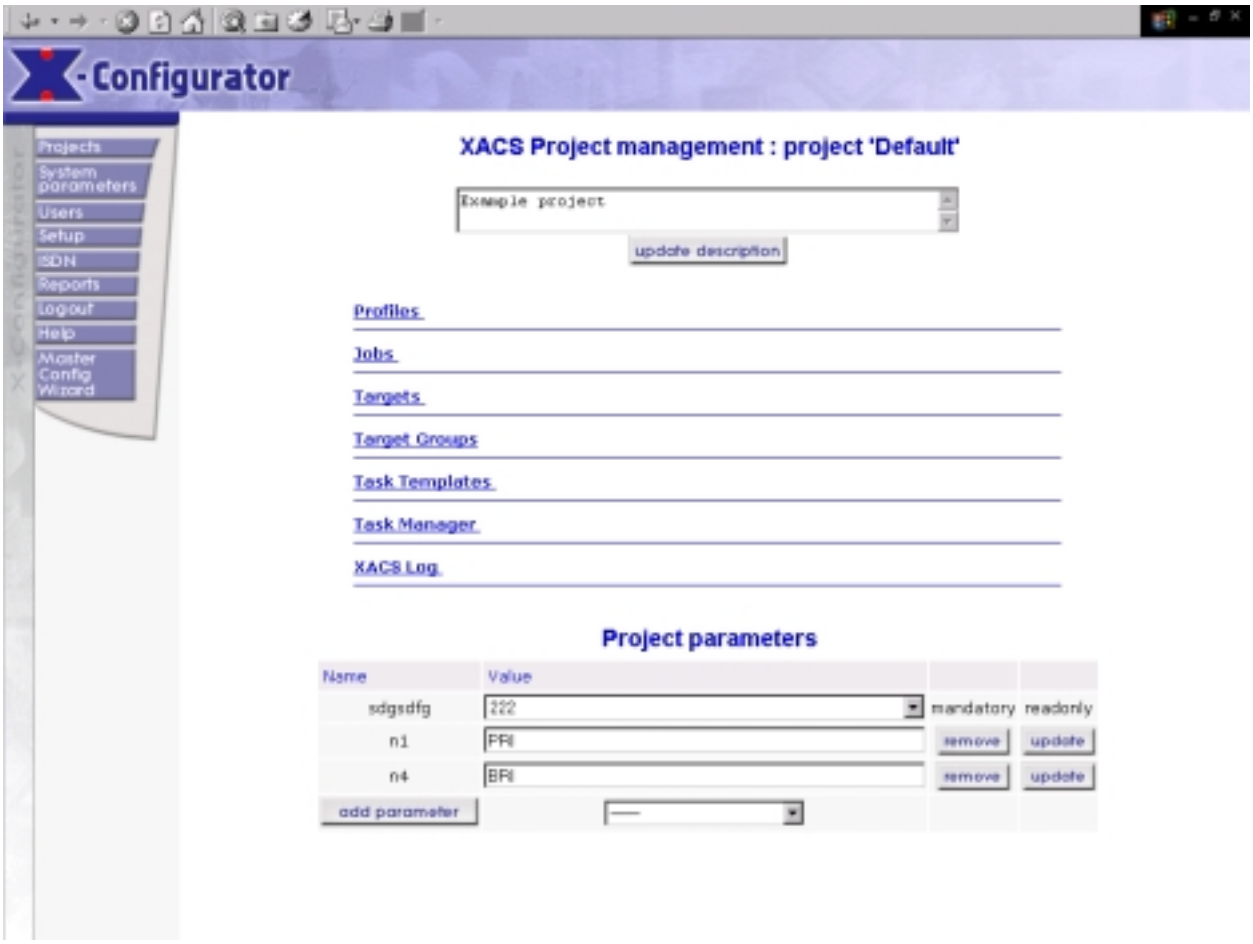


Figure 3 The view in "Projects" option of X-Configurator

6.1.1. Create New Project

This option is available in Project option of the X-Configurator. In order to create new project, first enter the appropriate name in the *New project name* field and then click **Create project** to write the changes to the database.

Note:
Currently logged user automatically gains full to rights to the new created project.

6.1.2. Edit Project

This option is available in Project option of the X-Configurator. Click on the name of the project you want to edit. A new window will appear in which you will be able to set up each component of every project. You can edit the following components:

- *Profiles* - allows you to manage the profiles used in the project. See also the description of Profiles option.
- *Jobs* - allows you to create, add and remove jobs in the project. See also the description of Job option.

- *Targets* - allows you to include target devices into project. See also the description of Target option.
- *Target Groups* - allows you to include and manage the target group in the project. See also the description of Target Groups option.
- *Task Templates* - allows you to set up the task templates for the entire project. See also the description of Task Templates option.
- *Task Manager* - allows you to view the task and system activity. See also the description of Task Manager option.
- *XACS Log* - allows you to set up and view the log for the project. See also the description of XACS Log option.

Note:
If you cannot edit the selected project it means that you don't have the necessary user's rights for the project. To view the project contents user needs at least the right "Read" for Profiles, Jobs, NAS or the others sub-components of each project.

6.1.3. Add/Update Project Description

This option is available in Project section of the X-Configurator. Click on project name to view its components. At the top of the page there is a field in which you can enter the description of the project. Once you entered new data click on **Update description** to save the changes.

6.1.4. Remove Project

In order to remove the project choose Project option from the main menu of the X-Configurator. A new window will appear with name's list of all defined projects. To remove any projects simply click on **Remove** button next to the chosen project name.

Note:
1. In order to remove the project the user must have required user's rights to execute this action.
2. If you cannot view the list of projects after choosing Project options from the main menu, check the user rights for the currently logged user. Such situation might occur that if the user has "No rights" set in user rights section.

6.1.5. Profiles

Profiles allow you to group parameters that can be configured on the target or the NAS. Profiles can be inherited from other profiles (from this selected as parent profile). The LUA job scripts may use parameters grouped in a profile. When you configure the target you can assign to it any chosen profile.

You can create a new profile in a project by selecting desired project from the Projects option of the X-Configurator and then choosing option Profiles. The new window will appear with a list of types of profiles, which you can create and associate with this project (see figure 4). You can create the following types of profiles:

- Target profiles - choose this option to create and manage parameters that will be configured on the targets (routers).
- NAS profiles - this option allows you to create and manage parameters that can be configured on the NAS (on router at central site, or RADIUS server).

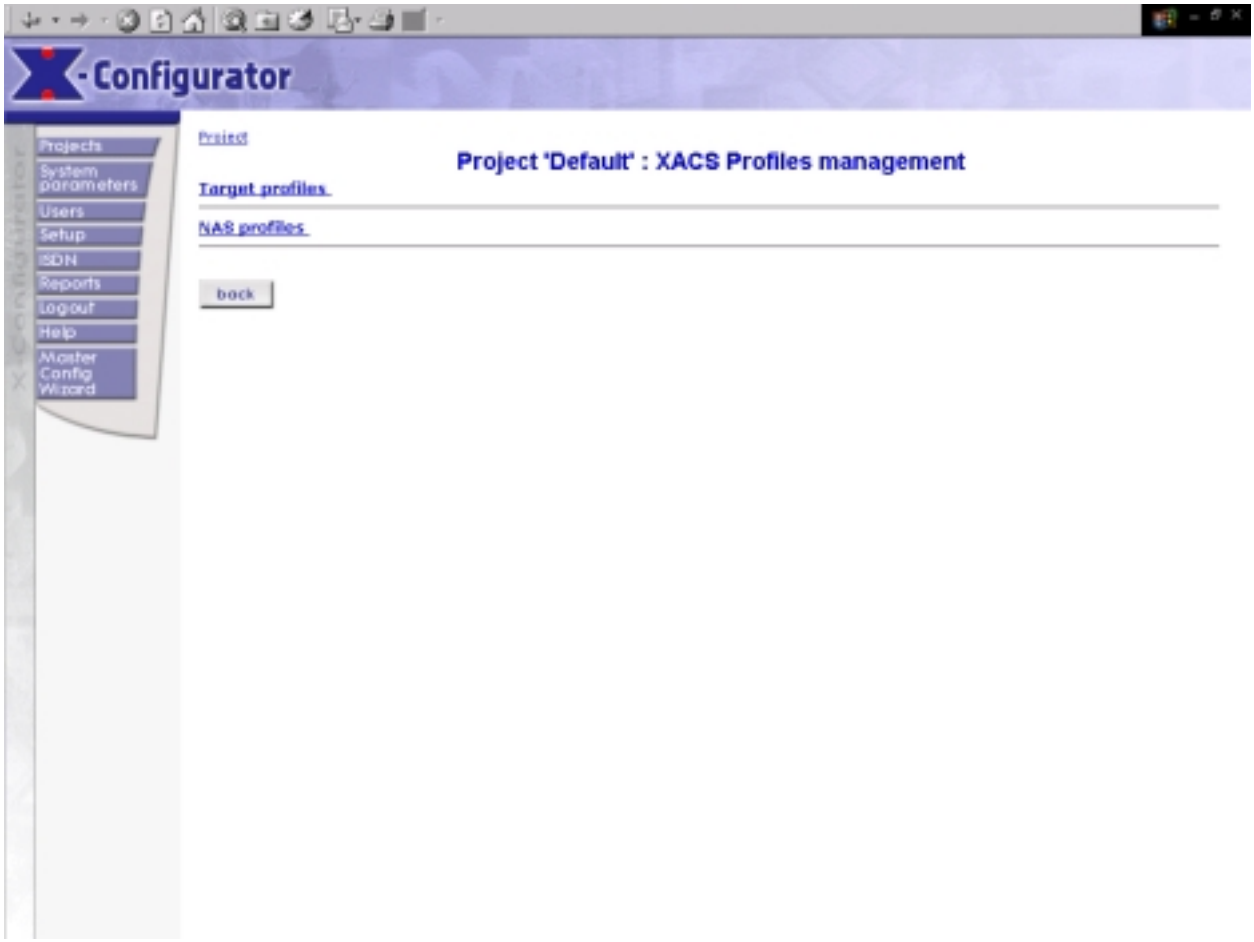


Figure 4 The view in Profiles option of X-Configurator

6.1.5.1. Create New Profile

You can create a new profile in a project by selecting desired project from the Projects option of the X-Configurator and then choosing option Profiles. A new window will appear with a list of profiles associated with this project. The list will be empty if you haven't configured any profiles before. In the *New profile name* field enter required name for the profile and click on the **Create new profile** button. New profile will be added to the database.

6.1.6. Target profiles

Target profiles allow you to create a set of parameters that will be configured on each target (router). Target profiles can be organized hierarchically therefore one profile can inherit all parameters from another profile (i.e. from parent profile). Figure 5 shows a sample view of Target profiles option.

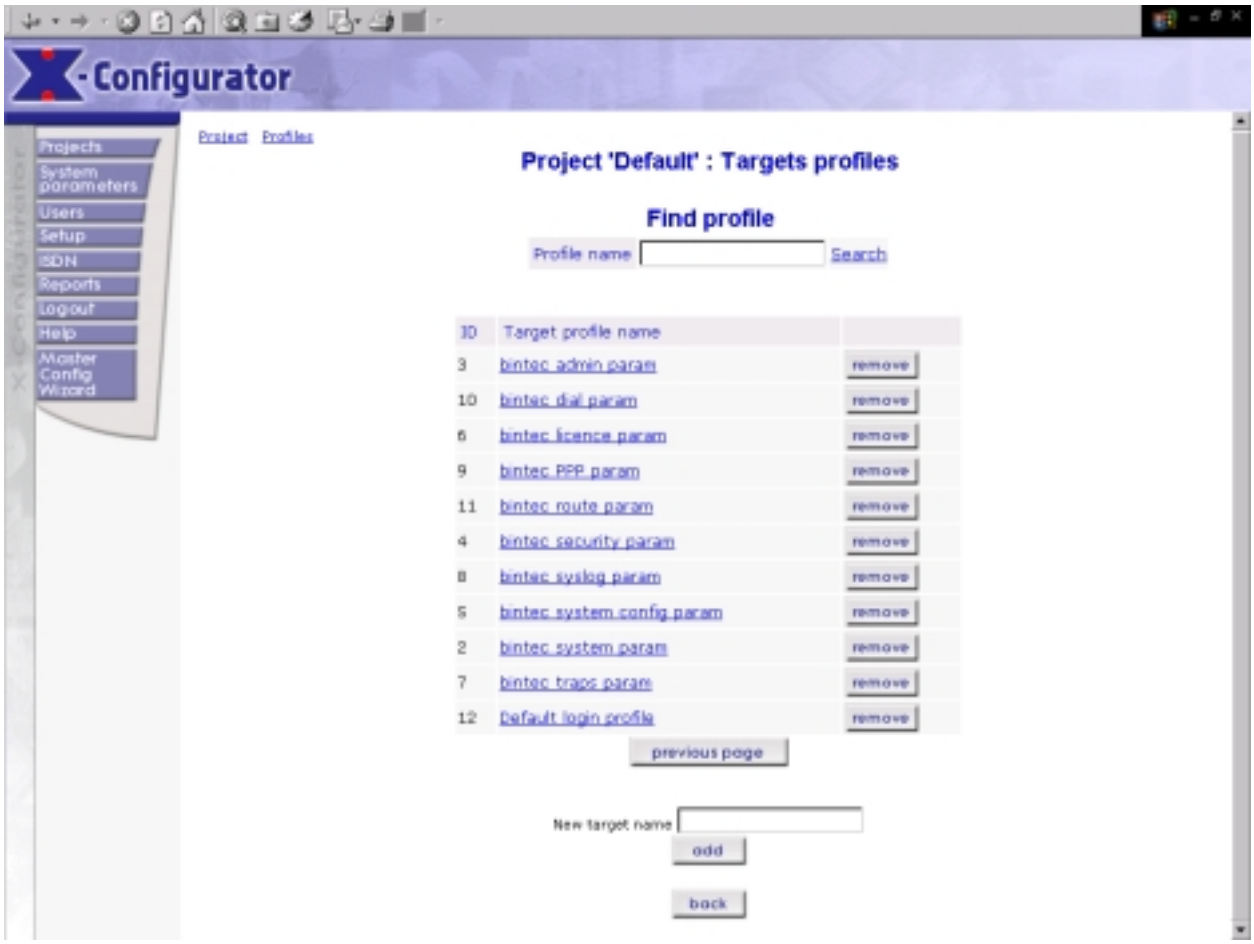


Figure 5 The sample view in “Target profiles“ option of X-Configurator

6.1.6.1. Create New Target Profile

You can create a new profile in a project by selecting desired project from the Projects option of the X-Configurator and then choosing option Profiles. Choose Target profiles and new window will appear with a list of target profiles associated with this project. The list will be empty if you haven’t configured any target profiles yet. In a *New profile name* field enter required name for the target profile and click on the **Create new profile** button. New profile will be added to the database.

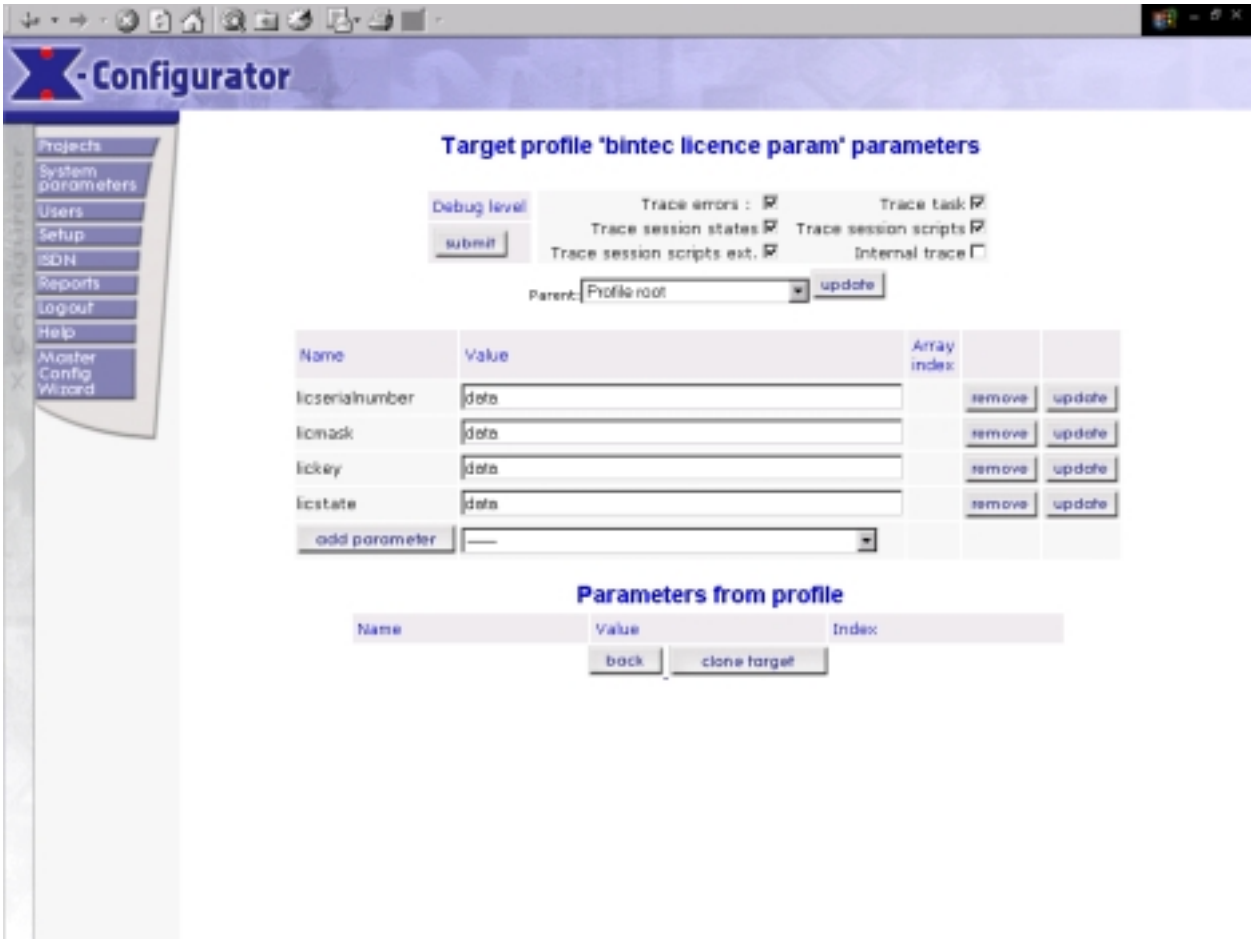


Figure 6 The sample view in “Create new Target Profile“ option

When you create new target profile (see figure 6) you can optionally set up the following options grouped in "Debug level" section:

- *Trace errors* - mark this field if you want to write error messages to the XACS Log.
- *Trace task* - mark this field if you want to write to the log messages from task execution. If this option is marked, information about the time when task was started and finished is written to the XACS Log.
- *Trace session states* - mark this field if you want to write to the log messages from the session states. If this option is marked, information about the time when session was created, started and finished is written to the XACS Log.
- *Trace session scripts* - mark this field if you want to trace the execution of the job script.
- *Trace session scripts ext.* - mark this field if you want to trace in details the execution of the job script.
- *Internal trace* - mark this field if you want to have the detailed trace from the system state. This option produces a large amount of information that is written to the XACS Log. Default value for this option is set to "off" and should be changed to "on" only if necessary.

To have a good idea of what happened in the system you should turn on debug for at least first four options.

Note:

1. Each target has to belong to one NAS.
2. Each target has to have parameters that allow to dial-out to this target (ISDN number), login name and login password. These parameters can be taken from target profile called "Default login profile" which is predefined and supplied with the X-Configurator.
3. The currently logged user who wants to remove the profile must have required user's rights to execute this action.

6.1.6.2. Find Target Profile

If you are going to find any target profile then choose Target profiles from Project option of the main menu of the X-Configurator. New view will appear with the list of all defined target profiles names. If you want to find any target profile then in *Target name* field input required target profile name and then press **Search**. If such target profile will be found then it appears as first on the list of defined profiles. If search fails then appropriate message will be displayed (Target profile not found).

6.1.6.3. Remove Target Profile

When you choose Target profiles from Project option of the main menu of the X-Configurator a new view will appear with list of all defined target profiles names. If you want to remove a target profile, click on **Remove** button next to the selected profile name. The selected target profile will be deleted from the database.

Note:

1. The currently logged user who wants to remove the profile must have required user's rights to execute this action.
2. If you cannot view the list of profiles in this option, check the user rights for the currently logged user. Such situation might occur when the user has “No rights” set in user rights section.

6.1.6.4. Set Parent for Target Profile

In *Parent* field you can set parent profile for the currently created target profile. To do this, just designate the appropriate target profile’s name from the list and choose **Set parent**. The target profile doesn't have to have a parent profile. Each target has to have parameters that allow to dial-out to this target (ISDN number), login name and login password. These parameters can be taken from target profile called "Default login profile" which is predefined and supplied with the X-Configurator.

6.1.6.5. Add Parameter to Target Profile

To add a new parameter to the current target profile select chosen parameter from drop-down menu and click **Add parameter** button. Then enter the value for this parameter in *Value* field next to the added parameter. To apply value for this parameter simply click on **Update** button, next to the appropriate parameter.

If you do not see any parameters in drop-down menu it means that you have to create parameters for the targets first. Refer to section Parameters for targets for more details.

6.1.6.6. Update Value of Target Parameter

To update the value of parameter input its new value in the field and click **Update** button to save changes in the database.

6.1.6.7. Remove Parameter from Target Profile

To remove a parameter from the target profile click on **Remove** button next to the appropriate parameter name.

6.1.7. NAS profiles

NAS profiles allow you to create a set of parameters that will be configured on each NAS point (central router), usually located at central site. The NAS profiles can be organized hierarchically, therefore one profile can inherit all parameters from other profile (i.e. from parent profile). When you choose a particular NAS profile, a new view will appear with a list of all targets served by this NAS.

Note:
Each target has to belong to one NAS.

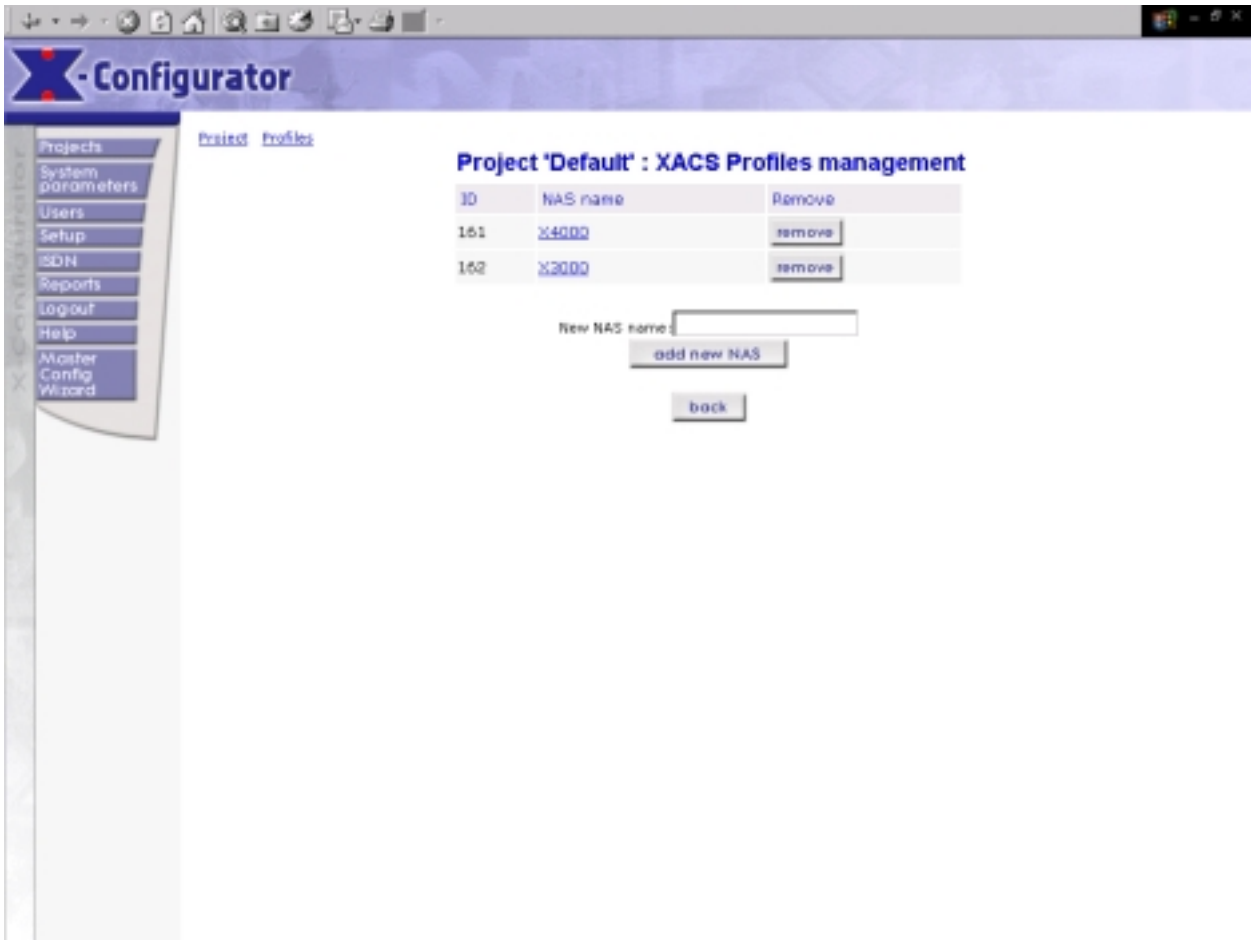


Figure 7 The view in “NAS profiles“ option of X-Configurator

6.1.7.1. Create New NAS Profile

You can create a new profile in a project by selecting desired project from the Projects option of the X-Configurator and then choosing option Profiles. When you choose NAS profiles, a new window will appear with a list of NAS profiles associated with this project. The list will be empty if you haven’t configured any NAS profile before. In the field *New profile name* enter required name for the NAS profile and click on the **Create new profile** button. New profile will be added to the database.

Note:

1. Each target has to belong to one NAS.
2. You have to have appropriate user's rights to be able create new NAS.

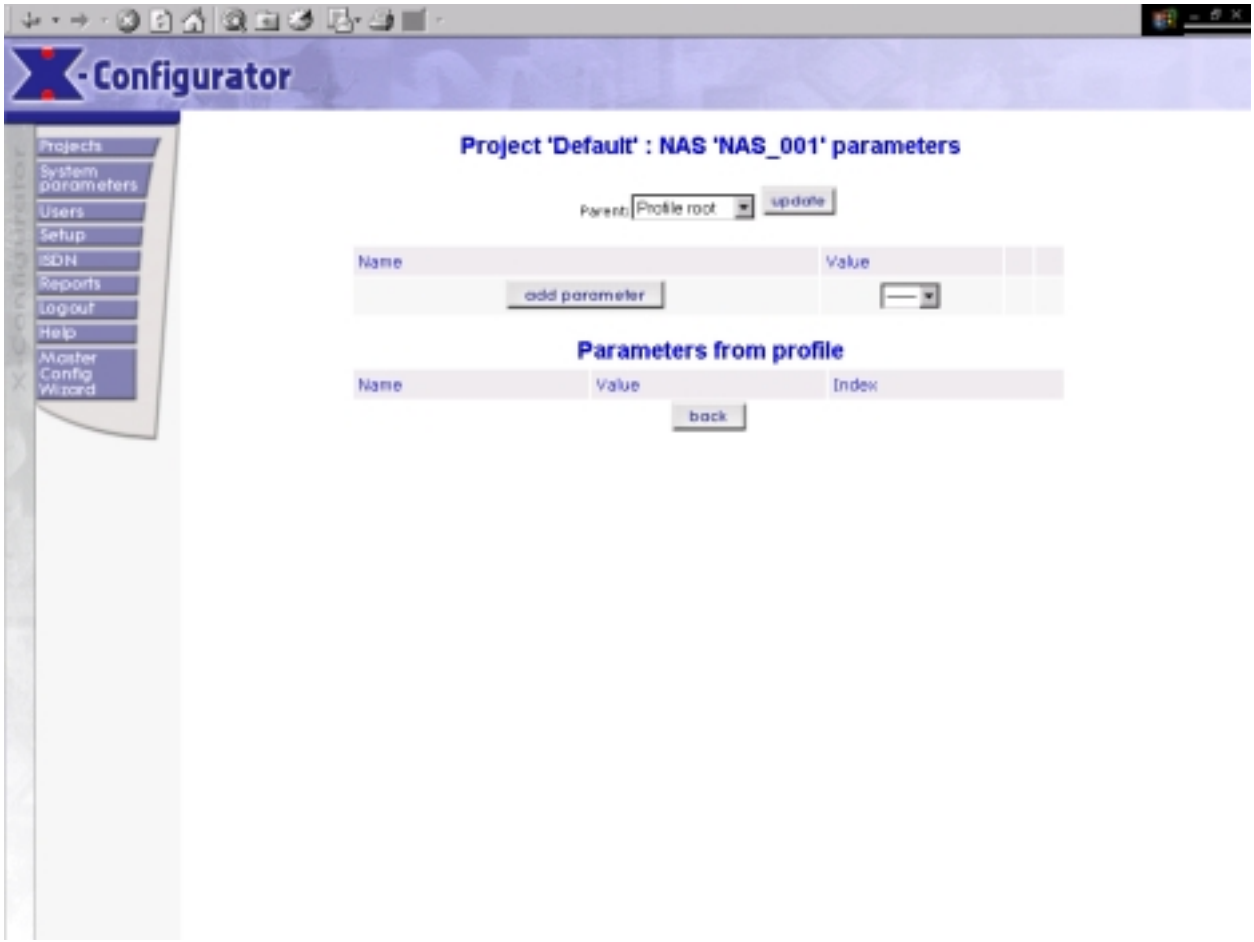


Figure 8 The sample view with NAS profile property

6.1.7.2. Remove NAS Profile

When you choose NAS profiles from Project option of the main menu of the X-Configurator a new view will appear with a list of all defined NAS profiles names. If you want to remove selected NAS profile, click on **Remove** button next to the appropriate profile name. The selected NAS profile will be deleted from the database.

Note:

1. The currently logged user who wants to remove the profile must have required user's rights to execute this action.
2. If you cannot view the list of profiles in this option, check the user rights for the currently logged user. Such situation might occur if the user has “No rights” set in user rights section.

6.1.7.3. Update Parent for NAS Profile

In *Parent* field you can set the parent profile for the currently created NAS profile. To do this simply designate the appropriate NAS profile name from the list and choose **Update parent**. The NAS profile doesn't have to have a parent profile.

6.1.7.4. Add Parameter to NAS Profile

To add a new parameter to the current NAS profile select appropriate parameter from drop-down menu and click **Add parameter**. Then enter the value for this parameter in *Value* field next to the added parameter. To apply value for this parameter simply click on **Update** button, next to the appropriate parameter.

If you do not see parameters in drop-down menu it means that you have to create parameters for the NAS first. Please refer to section Parameters for NAS for more details.

6.1.7.5. Update Value of Parameter

To update the value of particular parameter input its new value in the field and click **Update** to save changes in the database.

6.1.7.6. Remove Parameter from NAS Profile

To remove particular parameter from the NAS profile click on **Remove**, next to the appropriate parameter name.

6.1.8. Jobs

Jobs contain the set of actions, grouped in the LUA scripts file, that have to be performed during configuration. For a large rollout process here you can define a main job. This job contains the common most important parameters that have to be configured on the remote routers. In the jobs you can define what will be performed: configuration update, reset and return to the factory settings, firmware update on the router or creating new WAN partner. Jobs option can be found in the Project section of the X-Configurator. When you select a project name a new submenu will appear containing options for job. Figure 9 shows the sample view in this option.

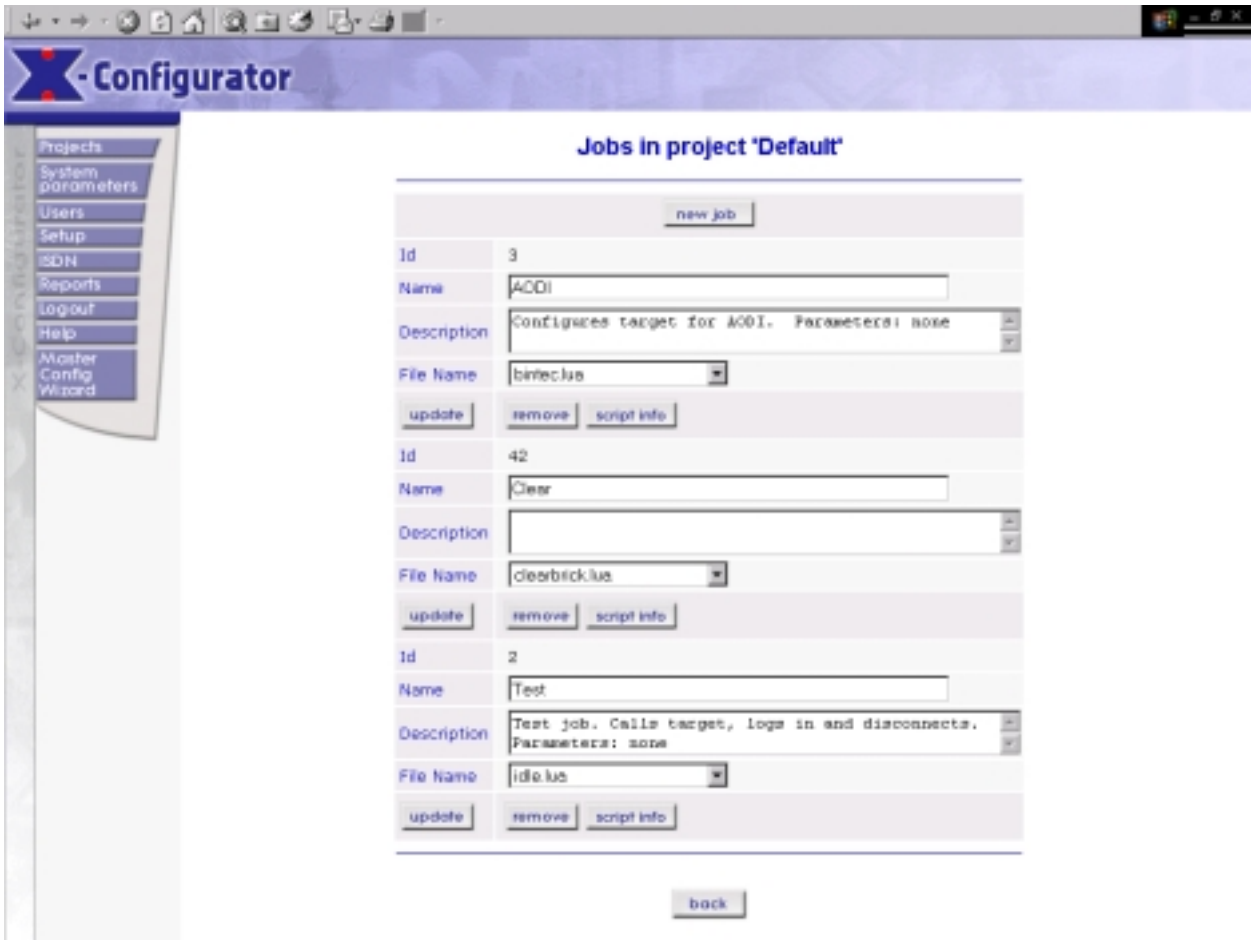


Figure 9 The sample view in “Jobs“ option of X-Configurator

6.1.8.1. Create New Job

This option allows you to create the new job. When you choose this option a new view will appear that allows you define the following information for the job:

- *Name* - enter in this field the name of the new created job.
- *Description* - you can add description for the new created job (optional).
- *Filename* - select here the filename of the job script file that contains a set of action that should be performed in the job. You don't have to input full path to the file. The X-Configurator will look for scripts in directories configured in *Script path* field of the Setup option.

When you fill in all the fields click on **Save** to add the job to the database.

6.1.8.2. Update Job

To update contents of any field simply enter new value in the desired field and click on **Update** button located next the appropriate job. Changes will be written to the database.

6.1.8.3. Remove Job

To remove the selected job from the project (and from the database), click on **Remove** button located next to the selected job.

6.1.8.4. Script Info

The functions contained in LUA script file can have a tag that shortly describes this function. An example of a tag is shown below:

```
--#####################################
--# Function: Testing()
--# Description: Here is the description
--# Description: section for the function
--# Globals: testaddr
--#####################################
function testing()
<INSTRUCTION 1>
<INSTRUCTION 2>
<INSTRUCTION 3>
<INSTRUCTION ...>
end
```

The information from this tag is displayed when you choose **Script info** button. Meaning of each column, which appears in a new window is described below:

- *Function* - this column displays the name of the function defined in "--# Function: " tag.
- *Description* - this column displays the description for the function defined in "--## Description: " tag(s).
- *Parameters* - this column displays the global parameters that are optionally used by this function and are defined in "--# Globals: " tag. If the function doesn't use global parameters then you don't have to write this tag.

If you do not define such tag in LUA script file for the function the window "Describe of LUA script" will be empty.

Note:
Tags for the functions contained in job script file are not mandatory.

6.1.9. Targets

Target represents configured device (router) and allows you to create a set of parameters that will be configured on this router (target). The target can inherit a set of parameters from any target profile selected as parent profile.

Each target is configured with a help of NAS. So, when you select Target option of the X-Configurator you must create first NAS and then targets that will be served by this NAS. The view for creating new NAS is shown in figure 10. When you select any NAS then new view appears with a list of targets served by this NAS (see figure 11).

6.1.9.1. What is NAS

NAS allows you to assign the targets to the appropriate central site router (NAS). For each project must be at least one NAS defined. When you choose the appropriate NAS the new view appears that lists all targets served by this NAS. In this window you can add/remove targets.

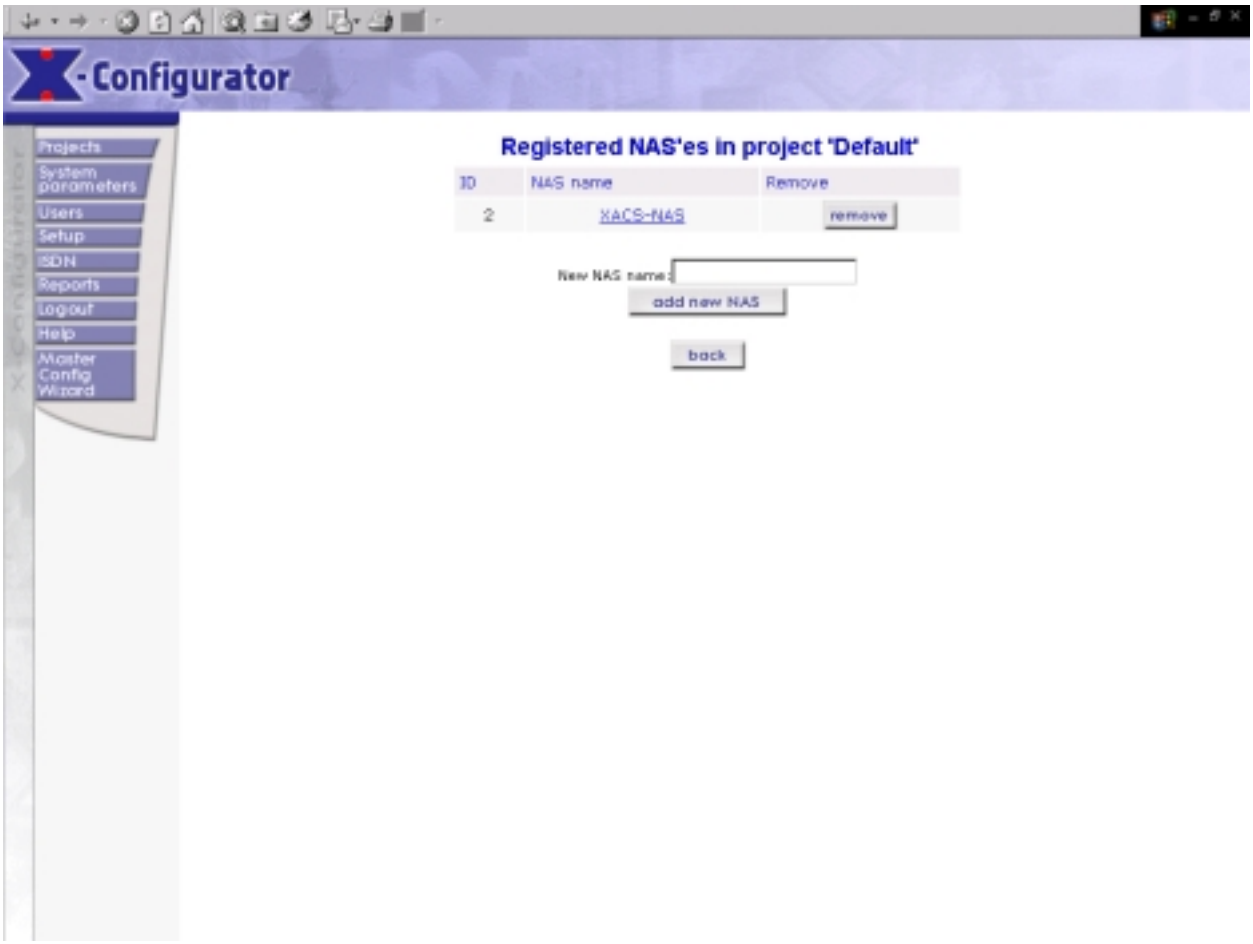


Figure 10 The view with sample registered NAS in “Targets“ option of X-Configurator

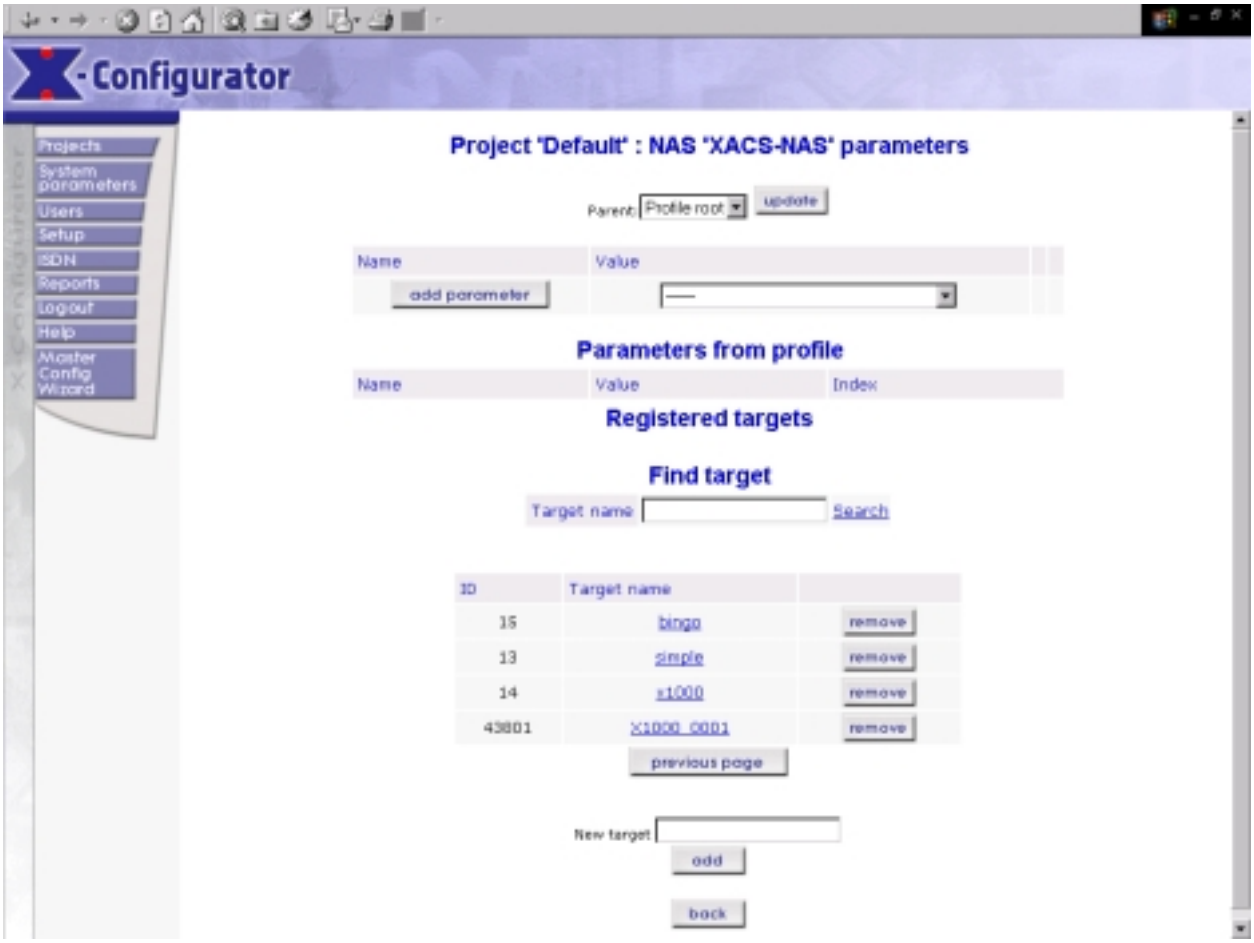


Figure 11 The sample list of targets served by NAS called XACS-NAS in option "Targets" of X-Configurator

6.1.9.2. Create New NAS

You can create a new NAS in the appropriate project by selecting desired project from the Projects option of the X-Configurator and then choosing Targets option. The new window appears with a list of NASes associated with this project. The list is empty if you haven't configured any NAS yet. In the field *New NAS name* enter required name for the NAS and click on the **Create new NAS**. New NAS will be added to the database.

Note:

1. Each project has to have configured at least one NAS that will serve the targets (routers).
2. Each target must belong to one NAS.

6.1.9.3. Update NAS

You can change any information for the selected NAS associated with the appropriate project. You can add, change or remove any component is described below.

- Update parent NAS profile
- Add parameter for NAS
- Update value of NAS parameter
- Remove NAS parameter
- Remove NAS
- Add new target
- Edit target
- Clone targets
- Remove target
- Set parent target profile
- Update value of target parameter
- Remove target parameter

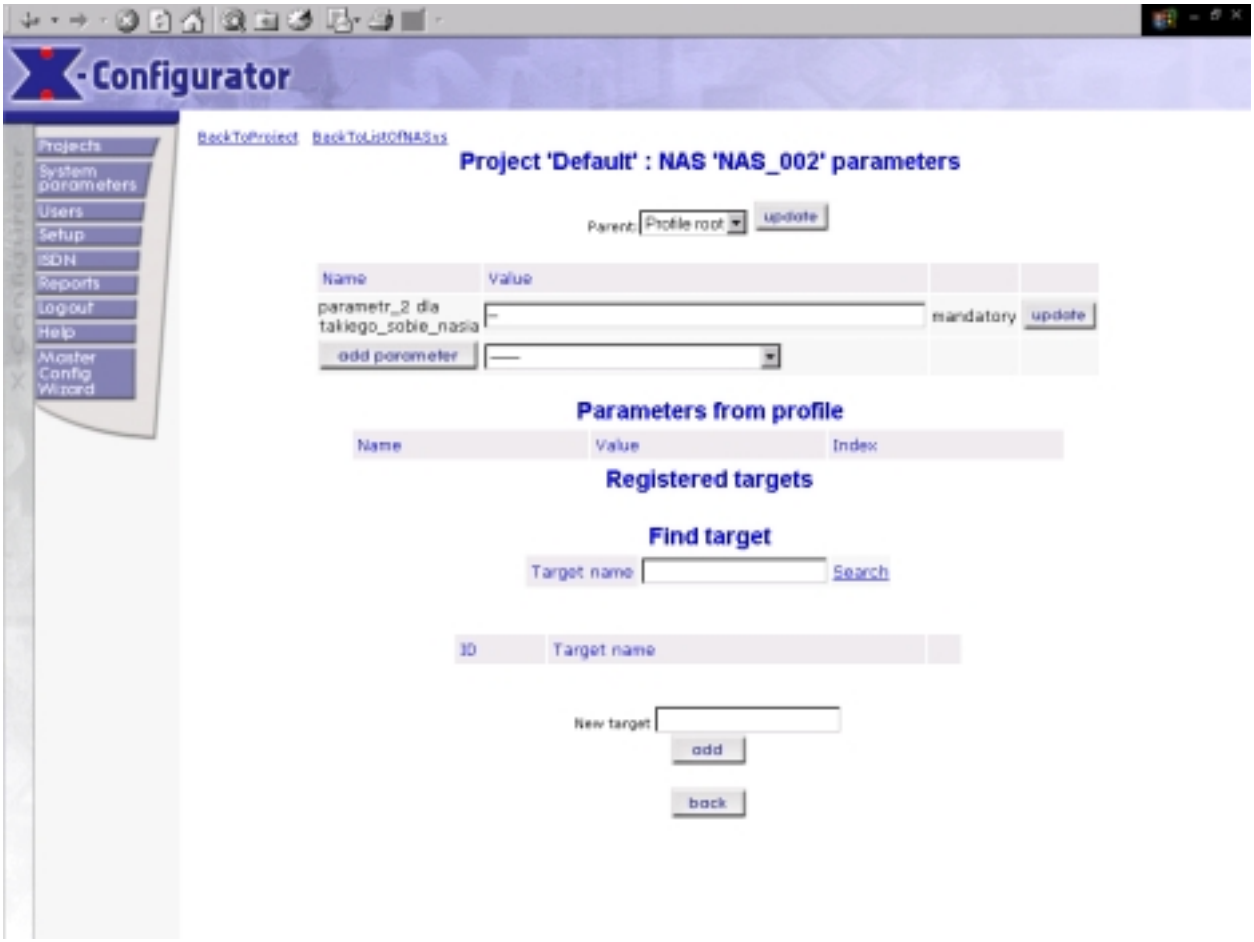


Figure 12 The view on properties for selected NAS

6.1.9.4. Update Parent NAS Profile

In *Parent* field you can set the parent NAS profile for the currently created NAS. To do this, simply designate the appropriate NAS profile's name from the list and choose **Update**. The NAS doesn't have to have a parent profile.

6.1.9.5. Add Parameter for NAS

To add new parameter to the current NAS just select appropriate parameter from drop-down menu and click **Add parameter**. After this, enter the value for this parameter in *Value* field next to the added parameter. To apply value for this parameter just click on **Update**, next to the appropriate parameter.
If you cannot see any parameter in drop-down menu then first, you have to create parameters for the NAS. See to section System parameters how to create parameters for NAS.

6.1.9.6. Update Value of NAS Parameter

To update the value of the appropriate parameter in the NAS input its new value in the field and click **Update** to save changes in the database.

6.1.9.7. Remove Parameter from NAS

To remove the appropriate parameter from the NAS click on **Remove**, next to the appropriate parameter name.

6.1.9.8. Remove NAS

When you choose Targets from the appropriate Project option of the main menu of the X-Configurator then new view appears with listed all defined in current project NAS names. If you want to remove the selected NAS then click on **Remove** next to the appropriate name. The definition of NAS will be deleted from the database.

Note:
The currently logged user who wants to remove the NAS must have appropriate user's rights to execute this action.

6.1.9.9. Add New Target to NAS

You can create a new target in a NAS by selecting desired NAS from the Projects option of the X-Configurator. When you select NAS name a new window will appear with a list of targets associated with this NAS. The list will be empty if you haven't configured any target before. In the field *New target* enter required name for the target and click on the **Add** button. New target will be added to the database and to current NAS. Once you have created new target you can set up the following options (see figure 13):

- *Debug level* – this section allows you to configure required debug level for this target. Here you will find the following:
  - *Trace errors* - mark this field if you want to write error messages to the XACS Log.

-*Trace task* - mark this field if you want to write to the log messages from task execution. If this option is marked, information about the time when task was started and finished is written to the XACS Log.

- *Trace session states* - mark this field if you want to write to the log messages from the session states. If this option is marked, information about the time when session is created, started and finished is written to the XACS Log.

- *Trace session scripts* - mark this field if you want to trace the execution of the job script.

- *Trace session scripts ext.* - mark this field if you want to trace in details the execution of the job script.

- *Internal trace* - mark this field if you want to have the detailed trace from the system state. This option produces a large amount of information that is written to the XACS Log. Default value for this option is set to "off" and should be changed to "on" only if necessary.

You should turn on the first four debug levels. For default settings of the debug level see also *Global debug level* field in Setup option.

- *Parent* - here you can set up parent profile for this target. Target has to have at least "profile root" (default) selected. You can find information about how to create the profile for targets in Target Profiles section.
- *Add parameter* - this field allows you to add the parameter for the target.
- *Remove* - click on this button to remove the parameter from the target.
- *Update* - change data in appropriate field and then click on **Update** button next to the changed value.
- *Parameters from profile* - this part of window displays the parameters inherited from the parent profile.
- *Clone target* - this button allows you to create clone of the current target. For more information refer to section Clone target.
- *Index array* - if the parameter is an array, you will see here an index in the array for this parameter.

Note:

1. Each target has to belong to one NAS.
2. The currently logged user who wants to remove the profile must have required user's rights to execute this action.

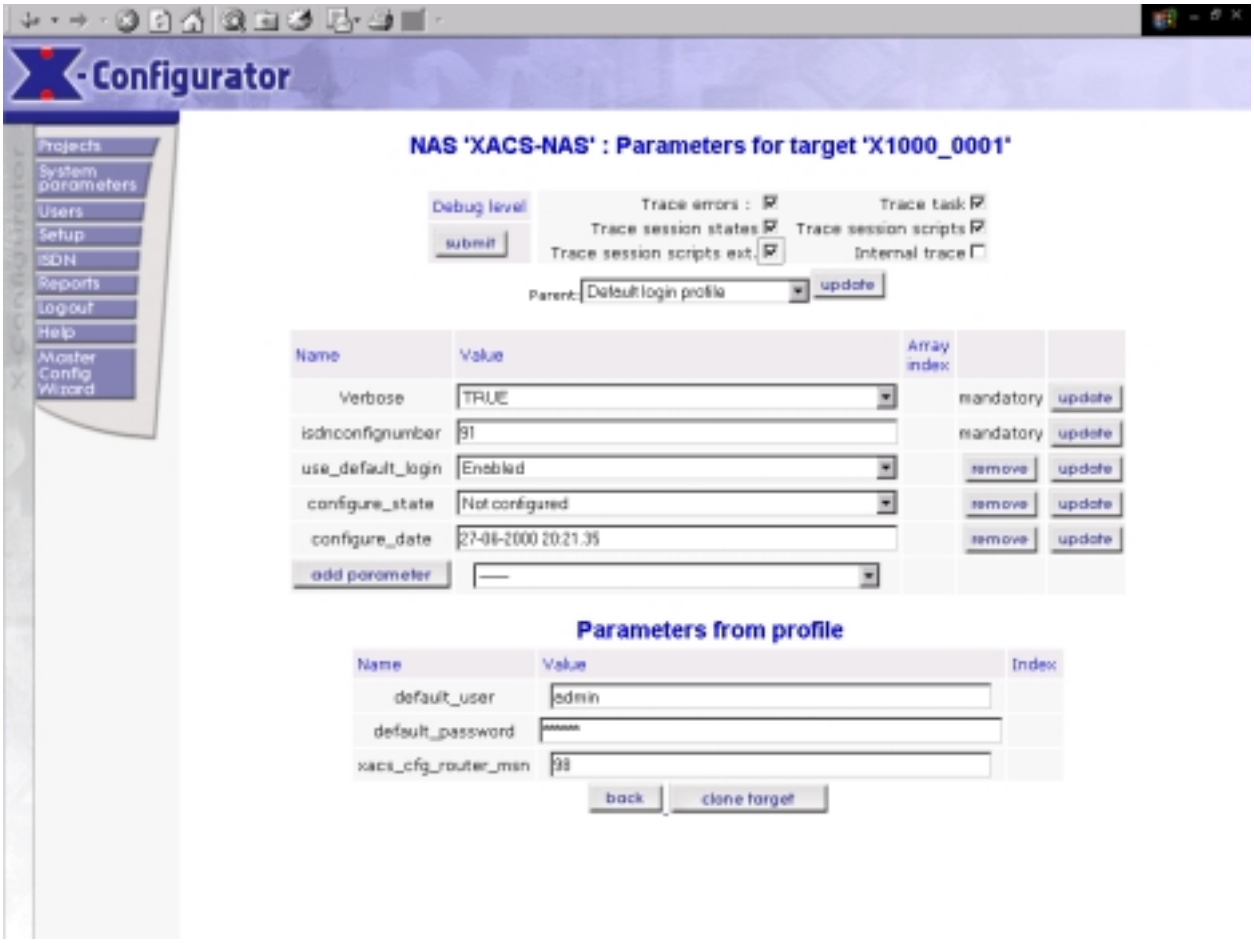


Figure 13 The sample properties for new created target served by NAS called here XACS-NAS

6.1.9.10. Find Target

You can find required target name by entering the name in *Target name* field and pressing **Search** button. When selected target name is found it appears on the top of the target's list.

6.1.9.11. Edit Target

You can edit target in the appropriate NAS by selecting desired NAS from the Projects option of the X-Configurator. When you select particular NAS name, a new window will appear with a list of targets associated with this NAS. The list will be empty if you haven't configured any target before. Click on target name to see the properties of this target. Also see Add new target to NAS for more information.

6.1.9.12. Clone Target

This option is available in Targets section of selected Project. When you select NAS a list of associated targets will appear. Select a target to view its properties, then choose **Clone target**. New window will appear which allows you to enter *Clone name* for the target. Additionally you can assign this clone to selected NAS. When you are ready simply click on **Create clone** button. A created clone has the same set of settings as a source target.

6.1.9.13. Remove Target

When you choose Targets option from Project option of the X-Configurator, new view will appear with a list of all defined NAS in this project. Select required NAS. A list of served targets will appear. If you want to remove selected target, click on **Remove** button next to the target name. The selected target will be deleted from the database.

Note:

1. The currently logged user who wants to remove the target must have required user's rights to execute this action.
2. If you cannot view the list of profiles in this option, check the user rights for the currently logged user. Such situation might occur that if the user has “No rights” set in user rights section.

6.1.9.14. Set Parent Target Profile

In *Parent* field you can set parent profile for the currently created target. To do this simply designate the appropriate targets profile name from the list and choose **Update**. The target doesn't have to have a parent profile.

6.1.9.15. Add Parameter for Target

To add a new parameter to the current target select the parameter from drop-down menu and click **Add parameter**. Then enter the value for this parameter in *Value* field next to the added parameter. To apply value for this parameter simply click on **Update** button next to the parameter.

If you do not see parameters in drop-down menu it means that you have to create parameters for the targets first. Refer to section Parameters for targets for more details.

6.1.9.16. Update Value of Target Parameter

To update the value of particular parameter input its new value in the field and click **Update** to save changes in the database.

6.1.9.17. Remove Target Parameter

To remove particular parameter from the target profile click on **Remove** button next to the appropriate parameter name.

6.1.10. Target Groups

This option appears when you choose particular project name in Project option of the X-Configurator. This option helps you to group targets into one group (for example based on their location). One group can contain other target group. This allows you to create hierarchy of the target groups. The sample view in this option is shown in figure 14.

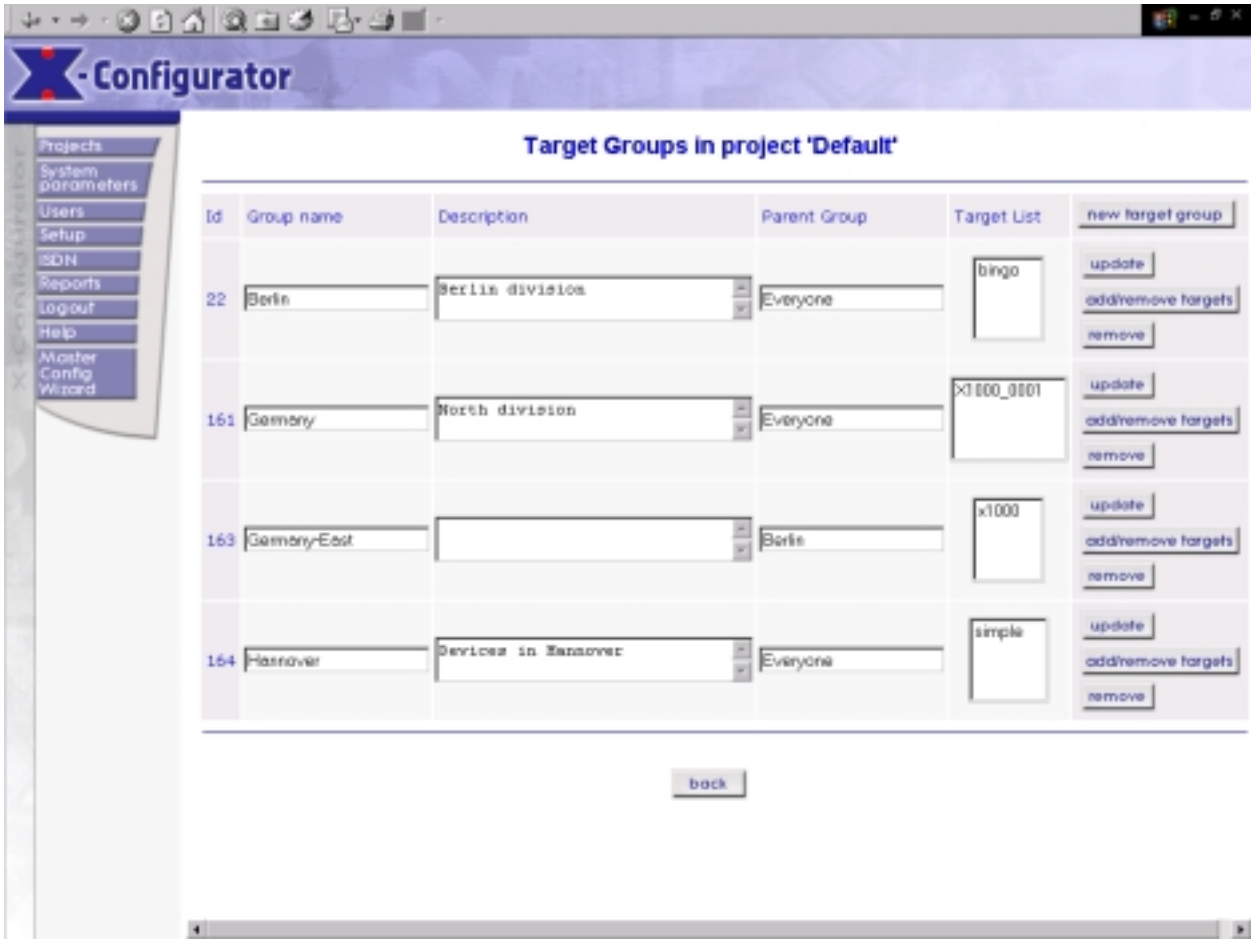


Figure 14 The sample target groups configured in “Target Groups“ option of X-Configurator

6.1.10.1. Create New Target Group

If you want to create the new target group click on the **New target group** button. When you choose this option, a new window will appear, which will allow you to define the following properties:

- *Group name* - in this field enter the name for the new created target group.
- *Description* - optionally you can add a description of the new created target group.
- *Parent group* - select from the drop down menu appropriate parent group. This is not mandatory. If you don't choose any parent group, group *Everyone* is taken as a default.
- *Target list* - select from this window targets which will belong to this group.

Click **Save** to add the definition of new target group to the database.

6.1.10.2. Update Target Group

If you want to change any information associated with particular group (i.e. name or description), enter the information in selected field and click on **Update** button, next to the appropriate target group. The information will be changed and written to the database.

6.1.10.3. Add Target to Target Group

If you want to add a target to selected group, click on the **Add/Remove target** button, next to the appropriate target group name. A new view will appear, containing two windows. In the left window you will see the list of defined targets not included in this group. If you want to add any target, select it from the list and click on **Add**. In the right window there is a list of targets contained in the current group.

6.1.10.4. Remove Target from Target Group

If you want to remove a target from selected group, click on the **Add/Remove** target button next to the appropriate target group name. A new view will appear containing two windows. In the right window you will see the list of targets contained in the current group. If you want to remove any target, select it from the list and click on **Remove**. In the left window you will see the list of defined targets not included in this group.

6.1.10.5. Remove Target Group

If you want to remove selected target group, simply click on **Remove** button next to the appropriate target group name. This will remove the definition of a target group from the database.

6.1.11. Task Templates

Task template groups together the following information:

- List of targets or/and target groups.
- Job, which has to be run for all those targets.
- Start conditions

To be able to make configuration process for the router (target) user must define task template, which will realize this. You can create Task templates from Project menu of the X-Configurator by selecting the appropriate project name. In figure 15 is shown the sample view in Task Templates option.

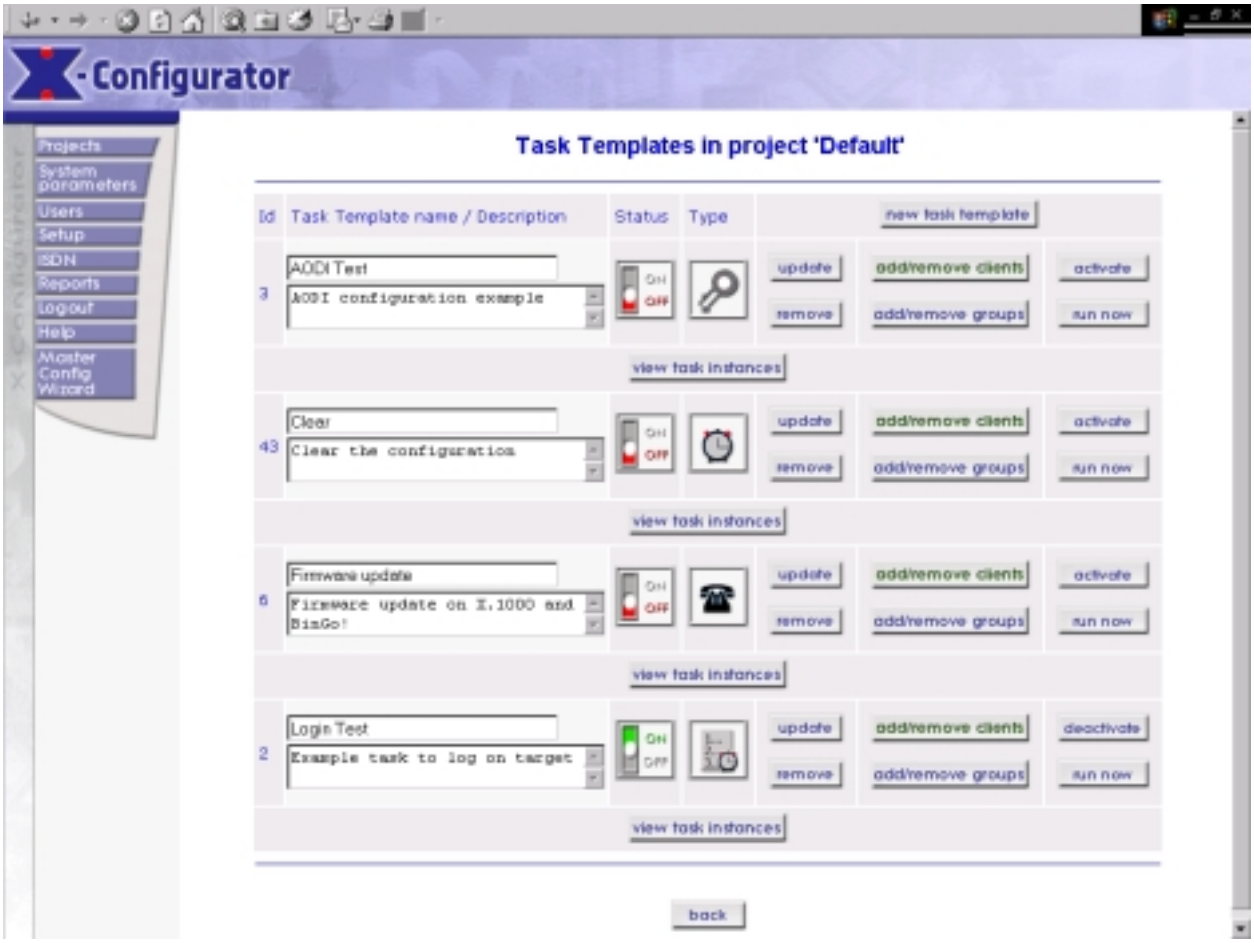


Figure 15 The view with sample configured tasks in “Task Templates“ option of X-Configurator

6.1.11.1. Create New Task Template

Choose *New task template* from Task template. A new window will appear (see figure 16) with the following fields:

- *Task name* - in this field enter required name for a new created task template.
- *Description* - in this field input optionally description for new created task template.

- *Job name* - from this drop down menu select the appropriate job that will be executed with the beginning of the task.
- *Job arguments* – enter here arguments for the selected job (optional).
- *Client selections rule* - this field allows you to enter rules that will apply to the targets. Rules can be defined in such way that they will be able to exclude matched targets. The rule is an expression in LUA language that uses variables defined for targets and NAS. Client selection rule applies to all start types of the task.
- *Start task type* - this field allows you to define how the task should be started. You may choose from the following types:

  a) On Time - task will be started at defined time. Choose this start type and click **Next** button. The resulting window will allow you to configure date and time when task will be started. See also information in sections Task start conditions and On Time Task for more details.

  b) Repeatable - task will be automatically started and repeated in the defined intervals. Choose this start type and click **Next** button. The resulting window will allow you to configure date and time when task will be repeated. See also information in sections Task start conditions and Repeatable Task for more details.

  c) On Call - task is waiting for incoming connection from target. Choose this start type and click **Next** button. The resulting window will allow you to define how to match digits from incoming call number. You will see the following fields:

  - *Rule matching* - this field defines how the incoming phone number is analyzed. If "Match all" is selected then all digits from calling number must match. If "Match first number" is selected then the first digit from the incoming call number is checked and matched. If "Match last number" is selected then the last digit from the incoming call number is checked and matched.

  - *Matching digits* - enter how many digits should be matched. Digits for the calling number are checked from right to left.

  See also information in sections Task start conditions and On Call Task for more details.

  d) On Event - task is started when the appropriate event in the database table appears. When you choose this start type and click **Next** a new window will appear which will allow you to enter the event name. See also information in sections Task start conditions and On Event Task for more details.

  For more information concerning task types please refer to XACS Scheduler section.

- *Task duration* - enter here the approximate time (in seconds) of the task duration (for example 360). When the time is out, the task is terminated by the XACS Scheduler.
- *Number of retries* - input here required number of retries for this task. If an error occurs while executing the task (due i.e. communication problems) XACS Scheduler will retry this task the number of times specified in this field. Input 0 (zero) if you don't want XACS Scheduler to make any retries.

When you click **Next** you will see the new window depending on the selected task start type. Click on **Save** to add task template to the database.

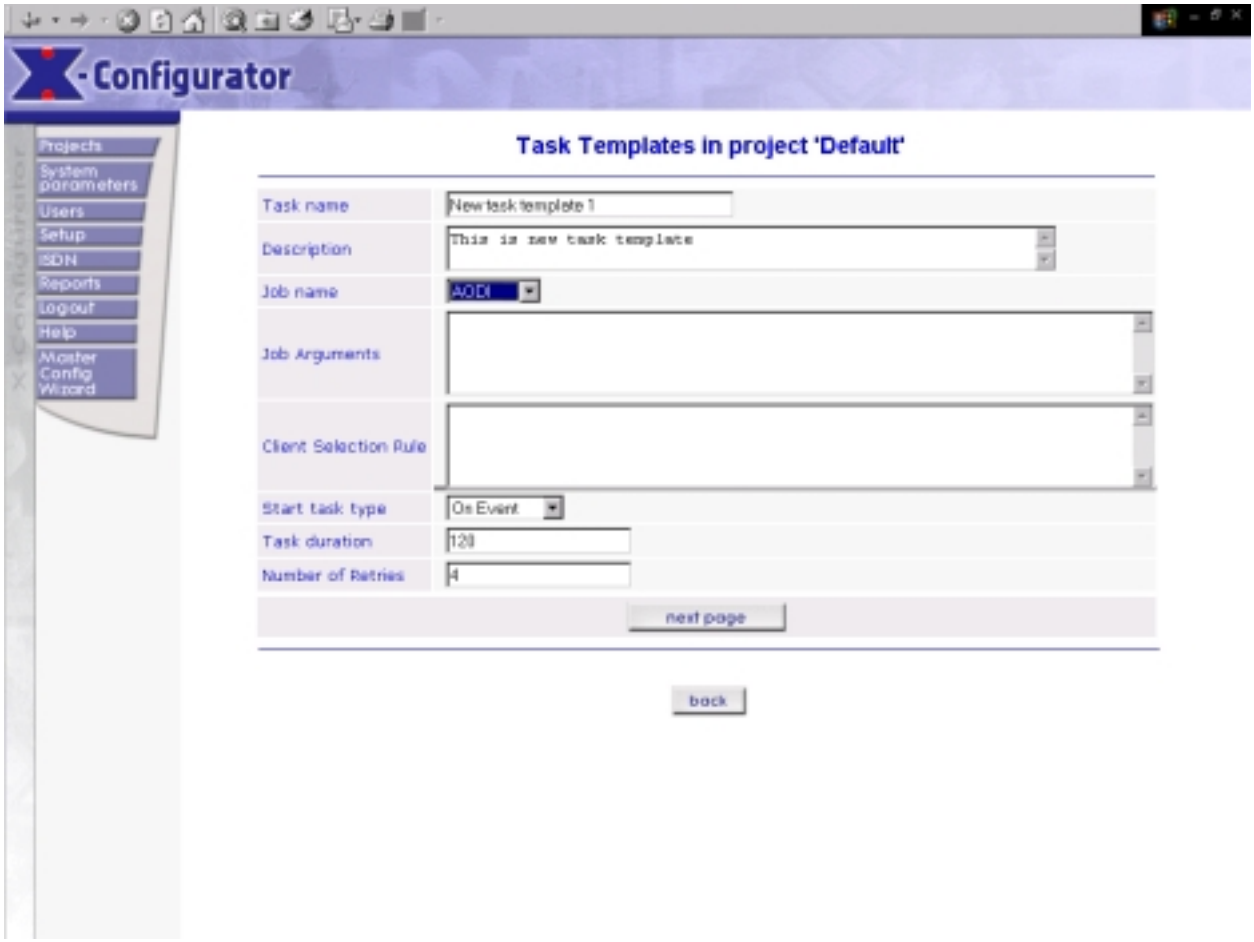


Figure 16 The view in “New Task Template“ option of X-Configurator

6.1.11.2. Update Task Template

To update any information in the task template (i.e. name, description, start time), click on the **Update** button, next to particular task template. The new view will appear identical like in Create new task template option. Please refer to the description of this option.

6.1.11.3. Add/Remove Target to/from Task Template

Each task template has to have at least one target. To associate the target or targets with the task template click **Add/remove** target button, next to selected task template name. A new view will appear containing two windows. In the left window you will see the list of defined targets not included in this task template. To add any target, simply select it from the list and click **Add**. In the right window you will see the list of targets contained in the current task template. To remove target, select it from the list and click **Remove**. When you finish adding/removing targets, click on **Back** button.

6.1.11.4. Add/Remove Target Group to/from Task Template

Each task template has to have at least one target. To associate the target group(s) with the task template click **Add/remove group** button, next to particular task template name. A new view will appear containing two windows. In the left window you will see the list of defined target groups not included in this task template. To add any group, simply select it from the list and click **Add**. In the right window there is a list of groups contained in a current task template. To remove the group, select it from the list and click **Remove**. When you finish adding/removing target groups, click on **Back**.

6.1.11.5. Activate

The task must be activated to be ready to execute required actions. When you finish configuring task template, you have to activate the task. You can do this by clicking on **Activate** in appropriate task template.

6.1.11.6. Deactivate

The task must be activated to be ready to execute required actions. To stop the “active” task, click on **Deactivate** in appropriate task template. You can deactivate the task template at any time.

6.1.11.7. Run Now

Once the task template is in "active" state, you can start its task instance manually by clicking on **Run now**. The session(s) for the target(s) contained in the task template will be started.

6.1.11.8. Remove Task Template

To remove task template, click on **Remove** button associated with the task template you want to remove. The task template will be deleted from the database.

6.1.11.9. View Task Instances

If you want to watch the task instances from particular task template, click on **View task instances**. When you choose this option a new window will appear (see figure 17) with a list of all task instances. By choosing the **Sessions** option located next to each task instance you will be shown a new view with list of all sessions for this task instance (see figure 18). The **Details** option allows you to view the detailed information about selected session (see figure 19). The **Log** option allows you to view the messages written in XACS Log by the selected task session (see figure 20).

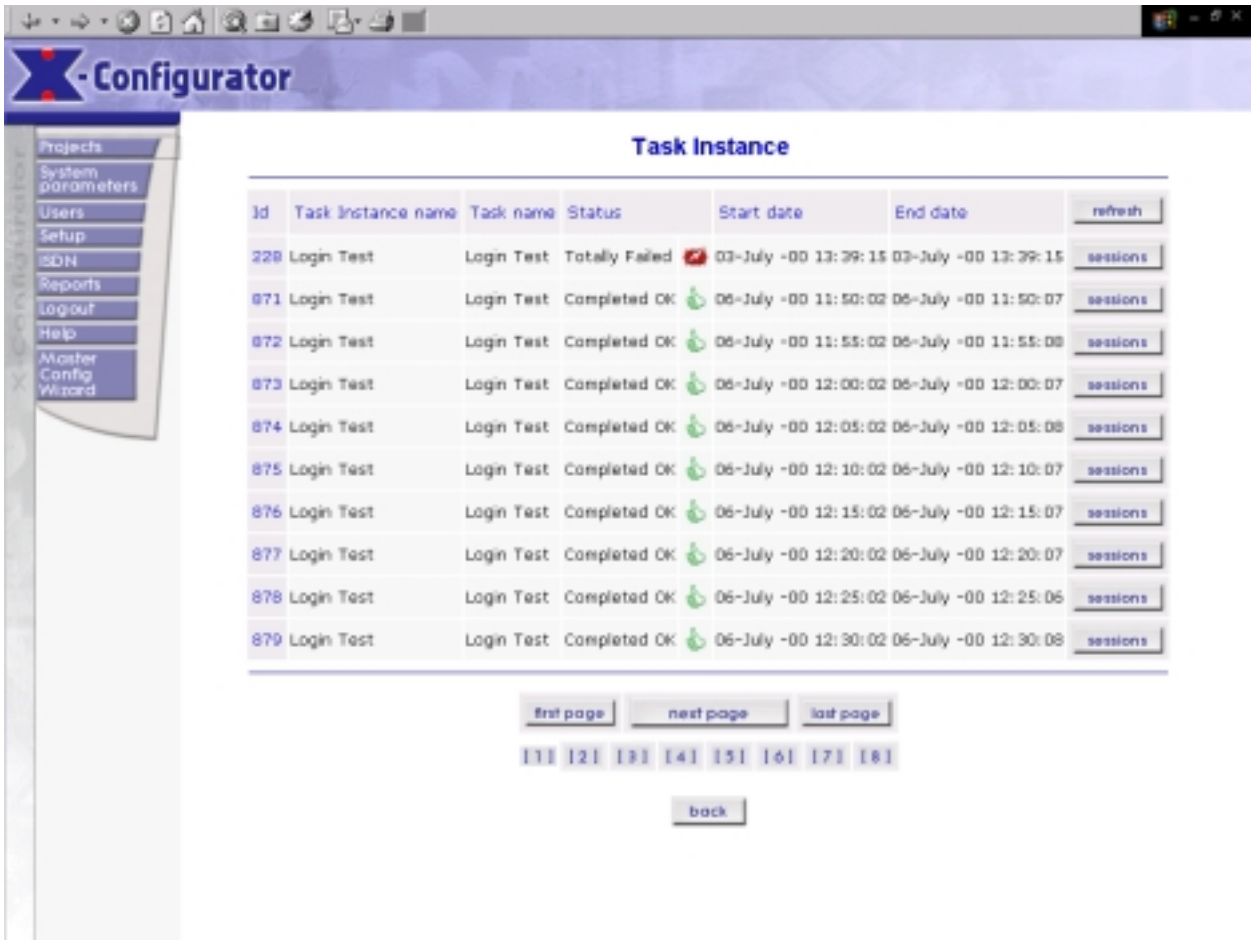

Configurator
Projects
System parameters
Users
Setup
ISDN
Reports
Logout
Help
Master Config Wizard
Task Instance
Id
Task Instance name
Task name
Status
Start date
End date
refresh
228 Login Test Login Test Totally Failed 03-July -00 13:39:15 03-July -00 13:39:15 sessions
871 Login Test Login Test Completed OK 06-July -00 11:50:02 06-July -00 11:50:07 sessions
872 Login Test Login Test Completed OK 06-July -00 11:55:02 06-July -00 11:55:08 sessions
873 Login Test Login Test Completed OK 06-July -00 12:00:02 06-July -00 12:00:07 sessions
874 Login Test Login Test Completed OK 06-July -00 12:05:02 06-July -00 12:05:08 sessions
875 Login Test Login Test Completed OK 06-July -00 12:10:02 06-July -00 12:10:07 sessions
876 Login Test Login Test Completed OK 06-July -00 12:15:02 06-July -00 12:15:07 sessions
877 Login Test Login Test Completed OK 06-July -00 12:20:02 06-July -00 12:20:07 sessions
878 Login Test Login Test Completed OK 06-July -00 12:25:02 06-July -00 12:25:06 sessions
879 Login Test Login Test Completed OK 06-July -00 12:30:02 06-July -00 12:30:08 sessions
first page
next page
last page
[1] [2] [3] [4] [5] [6] [7] [8]
back

Figure 17 The sample view in “View Task Instances” option

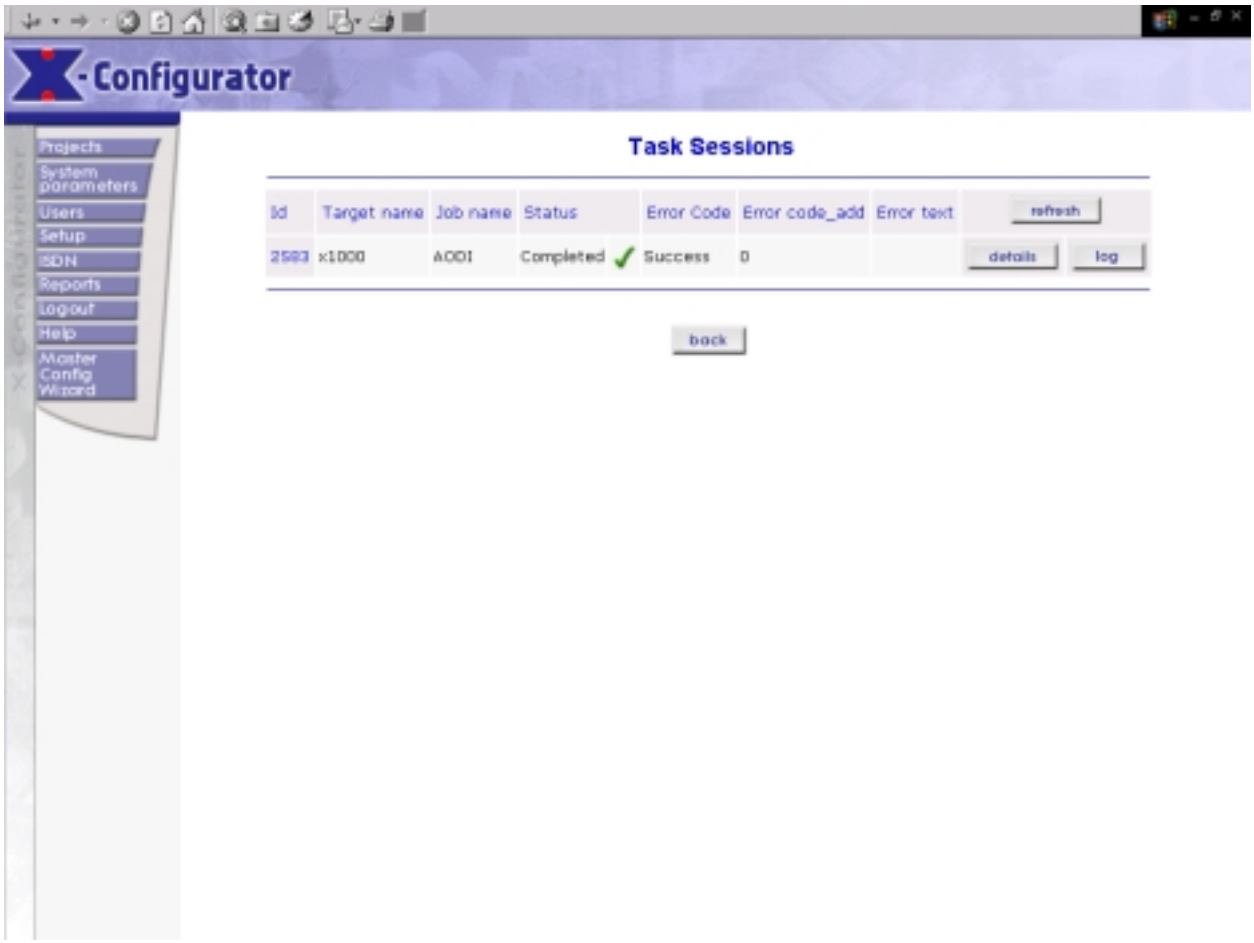


Figure 18 The sample messages in Task Sessions Log

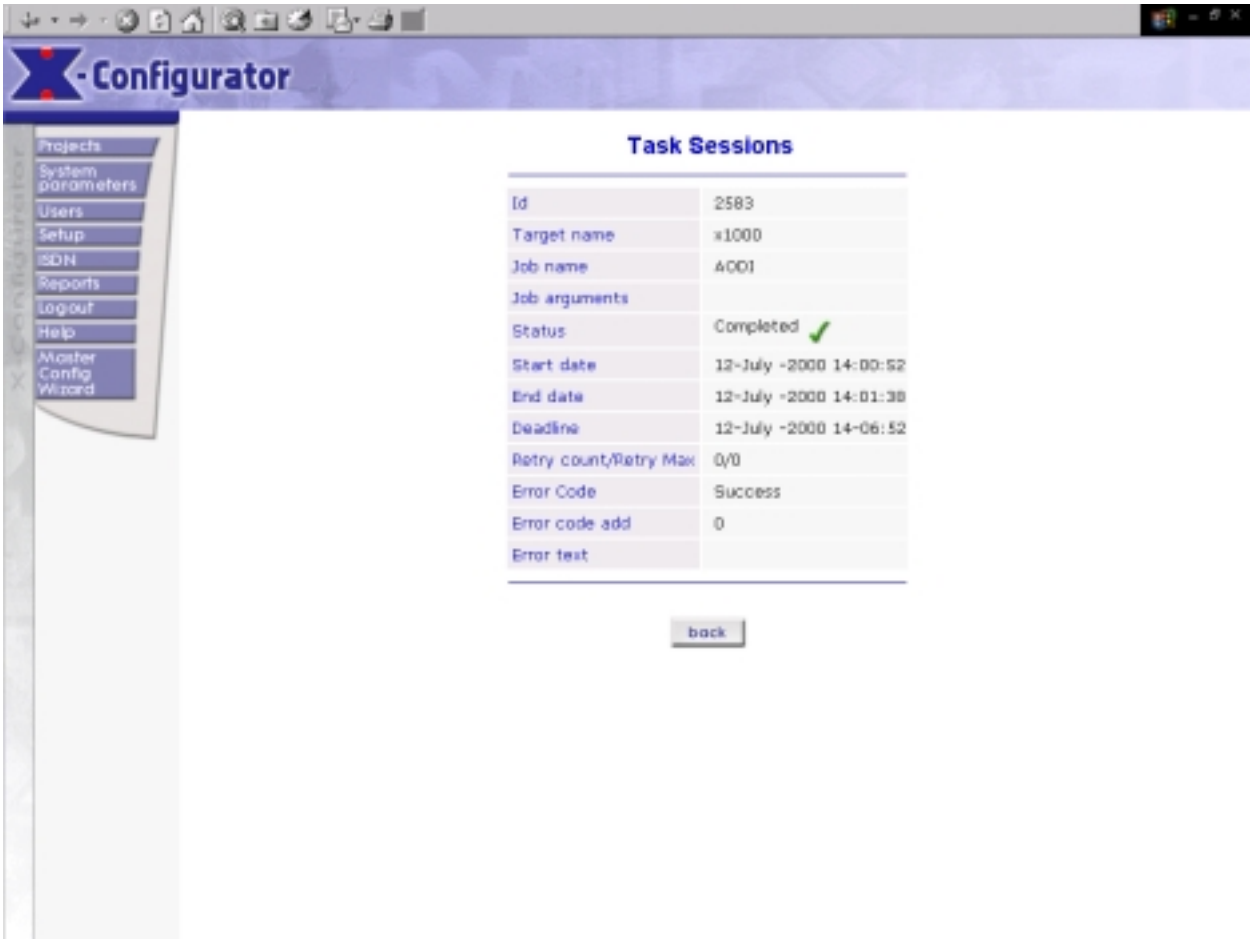
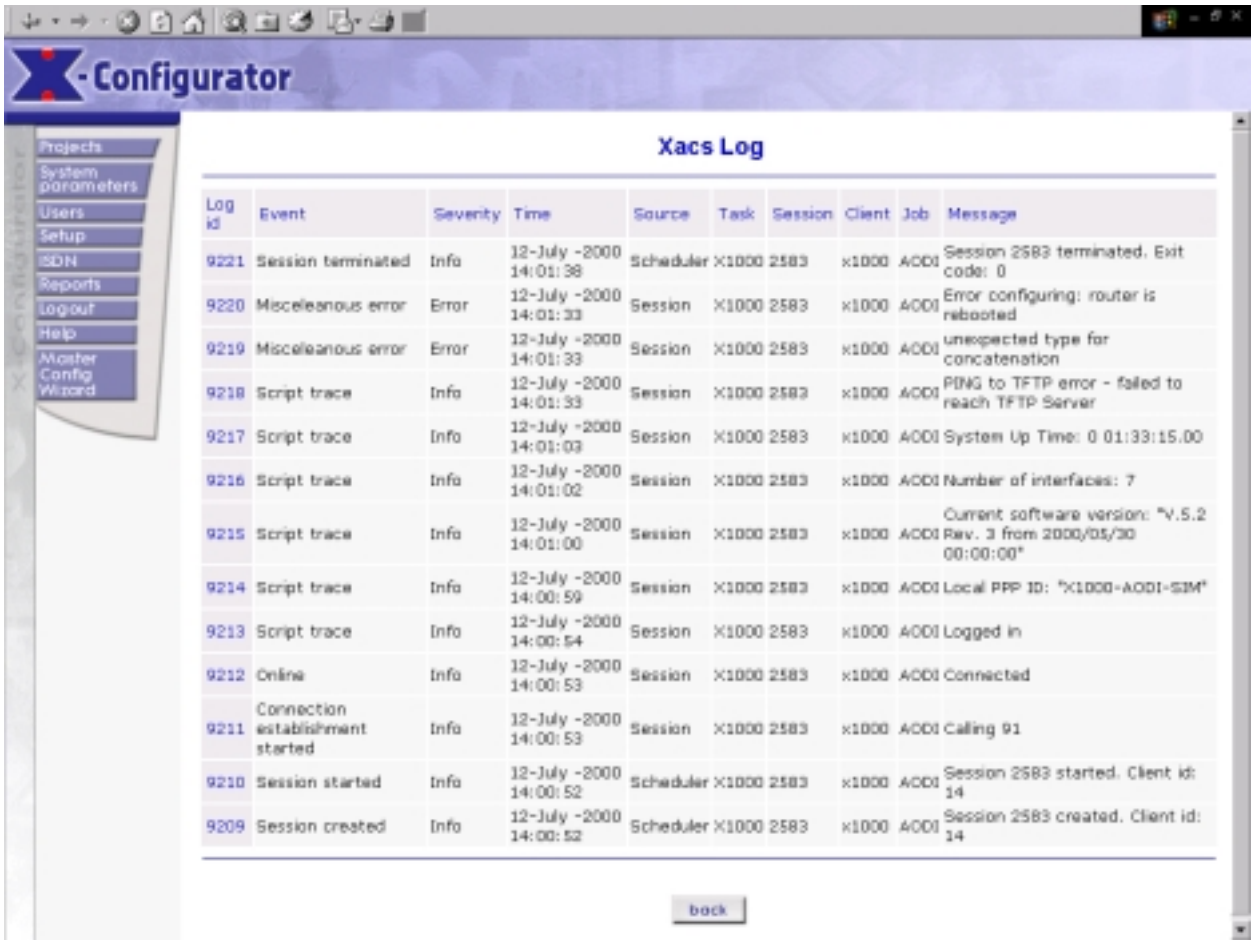


Figure 19 The sample view in “Details“ option located in “Task Sessions“



Log id	Event	Severity	Time	Source	Task	Session	Client	Job	Message
9221	Session terminated	Info	12-July -2000 14:01:38	Scheduler	X1000	2583	x1000	AODI	Session 2583 terminated. Exit code: 0
9220	Misceleanous error	Error	12-July -2000 14:01:33	Session	X1000	2583	x1000	AODI	Error configuring: router is rebooted
9219	Misceleanous error	Error	12-July -2000 14:01:33	Session	X1000	2583	x1000	AODI	unexpected type for concatenation
9218	Script trace	Info	12-July -2000 14:01:33	Session	X1000	2583	x1000	AODI	PING to TFTP error - failed to reach TFTP Server
9217	Script trace	Info	12-July -2000 14:01:03	Session	X1000	2583	x1000	AODI	System Up Time: 0 01:33:15.00
9216	Script trace	Info	12-July -2000 14:01:02	Session	X1000	2583	x1000	AODI	Number of interfaces: 7
9215	Script trace	Info	12-July -2000 14:01:00	Session	X1000	2583	x1000	AODI	Current software version: "V.5.2 Rev. 3 from 2000/05/30 00:00:00"
9214	Script trace	Info	12-July -2000 14:00:59	Session	X1000	2583	x1000	AODI	Local PPP ID: "X1000-AODI-SIM"
9213	Script trace	Info	12-July -2000 14:00:54	Session	X1000	2583	x1000	AODI	Logged in
9212	Online	Info	12-July -2000 14:00:53	Session	X1000	2583	x1000	AODI	Connected
9211	Connection establishment started	Info	12-July -2000 14:00:53	Session	X1000	2583	x1000	AODI	Calling 91
9210	Session started	Info	12-July -2000 14:00:52	Scheduler	X1000	2583	x1000	AODI	Session 2583 started. Client id: 14
9209	Session created	Info	12-July -2000 14:00:52	Scheduler	X1000	2583	x1000	AODI	Session 2583 created. Client id: 14

Figure 20 The sample messages from “Log“ option located in “Task Sessions“

6.1.12. Task Manager

This option is available in Project section of the X-Configurator for selected project. When you choose this option a new view will appear showing you Target/Activity matrix. This is the best way to view the status of the entire system and the appropriate target. For example, you can start here desired task for selected target. The window of the Task Manager consists of two panes. The top pane shows the “Activity Matrix” for all defined tasks and targets in the system. The bottom pane displays the current “System Activity”. Figure 21 shows sample view in this option.

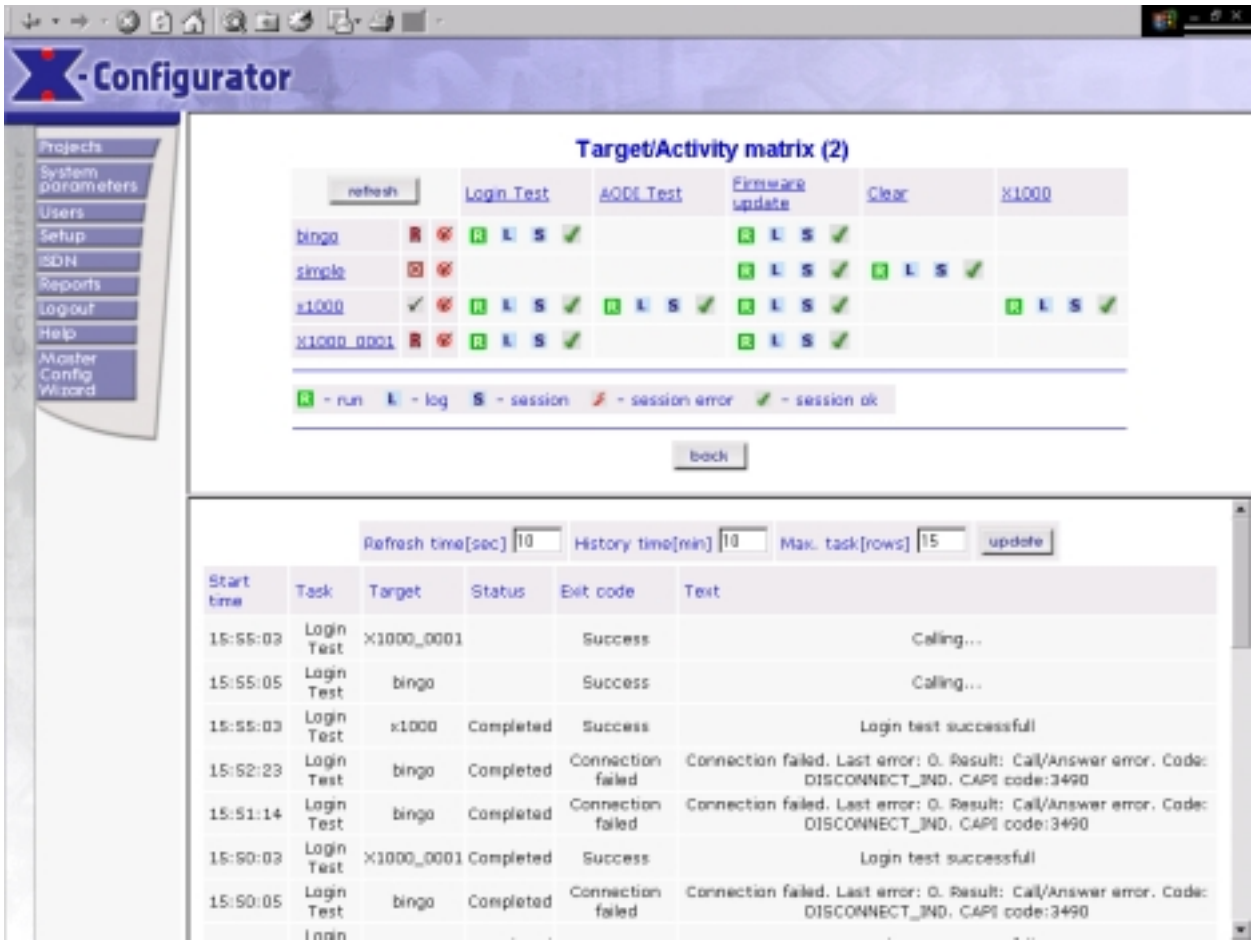


Figure 21 The sample view in “Task Manager“ option for appropriate project

6.1.12.1. Activity Matrix

This window displays matrix (see figure 21). The first row contains a list of defined tasks. The first column contains the list of all defined targets. In the intersection points you can execute actions represented by the following icons:

- L • Click on this icon to view the portion of the XACS Log for this task and target(s).
- S • Click on this icon to view the session log for the target(s) included in the task.
- R • Click on this icon to run the task for the specific target.

Additionally, next to each target you will see the graphic status of configuration state for this target. You will see here the following icons representing different configuration states of the task instance.

- ✓ • This icon indicates that configuration of this target was successfully executed. All sessions associated with this task instance completed successfully (i.e. their "error_code" is "0").
- ☒ • This icon indicates that an error occurred during configuration process. All sessions associated with the task instance completed but some of them have been successful and some failed.
- ⊗ • This icon indicates that this target(s) is not configured. It means that

target was not configured at all or his state was manual set up (target parameter: configure_state=Not configured).

- This icon indicates that the task instance is running (configuration process for any target is in progress). This is initial state. Instance stays in this state as long, as not completed sessions associated with this task instance exist.

- This icon indicates that the task instance state is unknown.

You will find more information about session states and task execution in the XACS Scheduler and Task instances states sections.

6.1.12.2. System Activity

This part of the Task Manager window (see figure 21) represents system activity and displays messages from the XACS Log. You can set up here the following options:

- *Refresh time* - time in second for refreshing the information in this window.
- *History time* - time in minutes defining how old messages should be displayed in the window.
- *Max task* - maximum number of rows displayed for each task.

To change the values of the parameter input the correct value and click **Update.**

Note:
If the currently logged user doesn't have the Admin user's right, Task Manager window will appear as default. User who doesn't have “Admin” right cannot access all menu options of the X-Configurator.

6.1.13. XACS Log

The XACS Log option is located in Project section of the X-Configurator. You can view the log of particular project. Once you have chosen a project, messages from the log will appear. You can use filters to extract messages that interest you from the XACS Log. You may choose multiple selection, which will allow you to select, for example "Info" and "Warning" severity at once and the source "Scheduler" and "Console". In figure 22 is shown sample view that you will see when you choose XACS Log option.

To extract required messages you may use the following filters operating on the fields from the database:

- *Severity* - this option allows you to filter and display only the messages with specific value in the severity field:
  1) All - display all messages written to XACS Log (don't look at the value in the severity field of the message).
  2) Info - display only the messages which contain in severity field "Info" (Information).

3) Warning - display only the messages that are stored in the XACS Log database with "Warning" in the severity field.

4) Error - display only the messages that are stored in the XACS Log database with "Error" in the severity field.

5) Fatal error - display only the messages that are stored in the XACS Log database with "Fatal error" in the severity field.

- *Event* - this option allows you to filter and display only the messages with specific type of event contained in the event field:
  1) Success - filter and display only this kind of events.
  2) Script trace - filter and display only this kind of events.
  3) Database access error - filter and display only this kind of events.
  4) Error reading setup data - filter and display only this kind of events.
  5) Error running script file - filter and display only this kind of events.
  6) Error initializing script engine - filter and display only this kind of events.
  7) Session interrupted - filter and display only this kind of events.
  8) Deadline reached - session terminated by scheduler - filter and display only this kind of events.
  9) Error creating task instance - filter and display only this kind of events.
  10) Error creating session - filter and display only this kind of events.
  11) Error update task instance status - filter and display only this kind of events.
  12) Error update session status - filter and display only this kind of events.
  13) No client matches event condition - filter and display only this kind of events.
  14) Error in event condition expression - filter and display only this kind of events.
  15) Miscellaneous error - filter and display only this kind of events.
  16) Error parsing cron string - filter and display only this kind of events.
  17) Time conditions not specified for repeatable task - filter and display only this kind of events.
  18) Connection establishment started - filter and display only this kind of events.
  19) Online - filter and display only this kind of events.
  20) Connection failed - filter and display only this kind of events.
  21) Login failure - filter and display only this kind of events.
  21) Connection terminated - filter and display only this kind of events.
  22) Error opening script - filter and display only this kind of events.
  23) Error reading client record - filter and display only this kind of events.
  24) Internal error - filter and display only this kind of events.
  25) Service started - filter and display only this kind of events.
  26) Service stopped - filter and display only this kind of events.
  27) Not enough memory - filter and display only this kind of events.

28) Session deactivated - filter and display only this kind of events.

29) Task instance created - filter and display only this kind of events.

30) Session created - filter and display only this kind of events.

31) Session started - filter and display only this kind of events.

32) Session terminated - filter and display only this kind of events.

33) Task instance terminated - filter and display only this kind of events.

34) Session retried - filter and display only this kind of events.

35) Update target error - filter and display only this kind of events.

36) Events number - filter and display only this kind of events.

- *Source* - this filter allows you to display messages from the selected XACS component:
  1) All - display the messages written to XACS Log by all XACS components.

  2) Scheduler - display only messages written to XACS Log by the XACS Scheduler.

  3) Console - display only messages that come from the X-Configurator console.

  4) Session - display only messages that were written at executing the task sessions.

  5) DBTrigger - display only messages written to XACS Log by the DBTrigger.

When you set up the appropriate filter criterion then click on **Run filtering** and the selected messages from XACS Log will be listed on the screen. Not all messages are displayed at once. Contents of XACS Log will be displayed in small portions on the page. You will see buttons that help you navigate in pages with XACS Log. For example, you will see buttons **Next** and **Previous** that will be listed appropriate portion of the XACS Log.

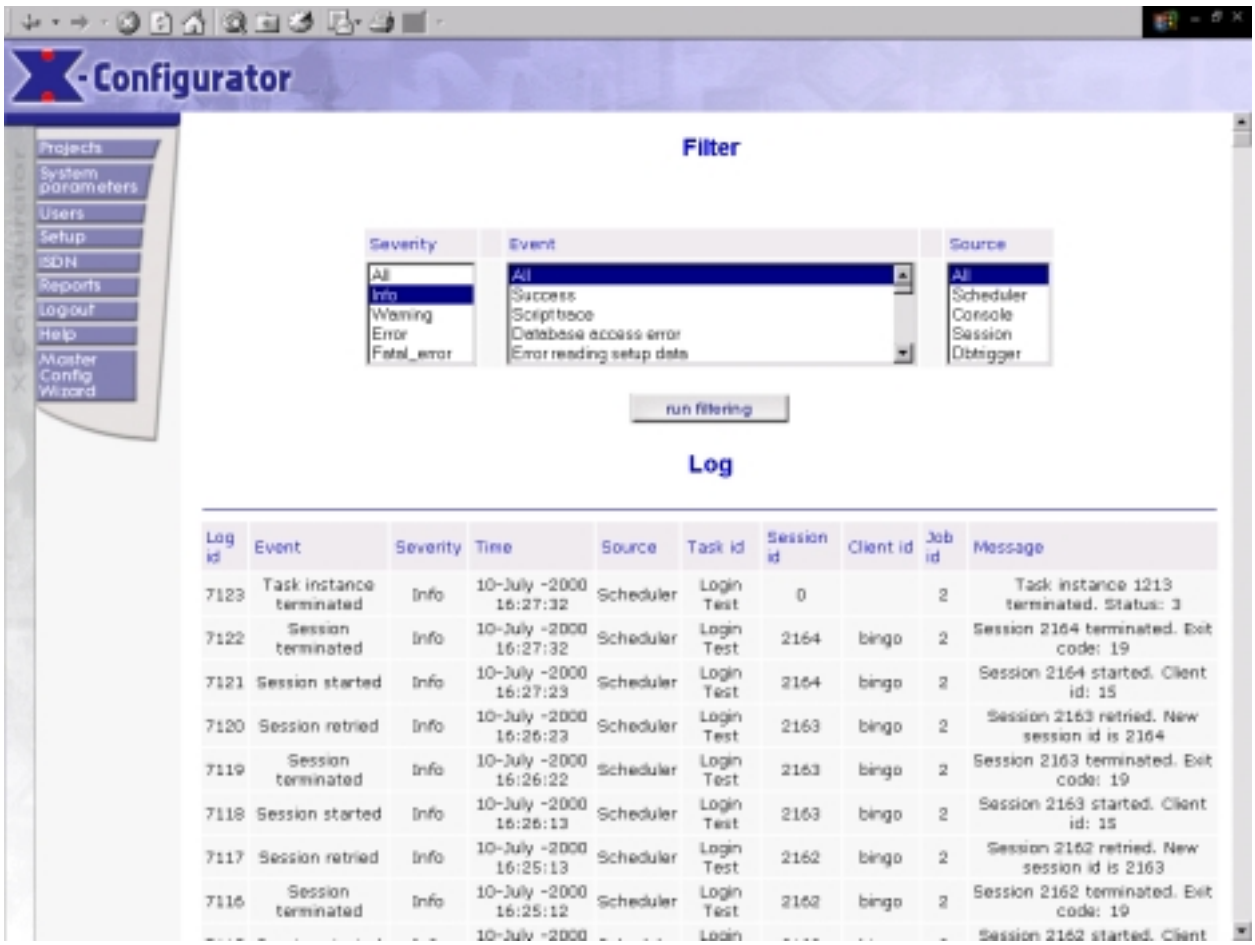

X-Configurator
Projects
System parameters
Users
Setup
ISDN
Reports
Logout
Help
Master Config Wizard
Filter
Severity
All
Info
Warning
Error
Fatal_error
Event
All
Success
Scripttrace
Database access error
Error reading setup data
Source
All
Scheduler
Console
Session
Dbtrigger
run filtering
Log
Log id | Event | Severity | Time | Source | Task id | Session id | Client id | Job id | Message
7123 | Task instance terminated | Info | 10-July -2000 16:27:32 | Scheduler | Login Test | 0 | | 2 | Task instance 1213 terminated. Status: 3
7122 | Session terminated | Info | 10-July -2000 16:27:32 | Scheduler | Login Test | 2164 | bingo | 2 | Session 2164 terminated. Exit code: 19
7121 | Session started | Info | 10-July -2000 16:27:23 | Scheduler | Login Test | 2164 | bingo | 2 | Session 2164 started. Client id: 15
7120 | Session retried | Info | 10-July -2000 16:26:23 | Scheduler | Login Test | 2163 | bingo | 2 | Session 2163 retried. New session id is 2164
7119 | Session terminated | Info | 10-July -2000 16:26:22 | Scheduler | Login Test | 2163 | bingo | 2 | Session 2163 terminated. Exit code: 19
7118 | Session started | Info | 10-July -2000 16:26:13 | Scheduler | Login Test | 2163 | bingo | 2 | Session 2163 started. Client id: 15
7117 | Session retried | Info | 10-July -2000 16:25:13 | Scheduler | Login Test | 2162 | bingo | 2 | Session 2162 retried. New session id is 2163
7116 | Session terminated | Info | 10-July -2000 16:25:12 | Scheduler | Login Test | 2162 | bingo | 2 | Session 2162 terminated. Exit code: 19

Figure 22 The view in “XACS Log“ option of X-Configurator with sample messages from XACS Log database

6.2. System Parameters

This option allows you to configure the following parameters:

- Project parameters - mark this option if you want to add, edit or remove a project parameter.
- NAS parameters - mark this option if you want to add, edit or remove a NAS parameter.
- Target parameters - mark this option if you want to add, edit or remove a target parameter.

When you select desired option(s) click **Apply** button. The new view will appear with defined parameters (see figure 23). If the new window remains empty it means that either user has no rights to use this option or there are no defined parameters. See section Rights in Users option to learn how to check user’s rights.

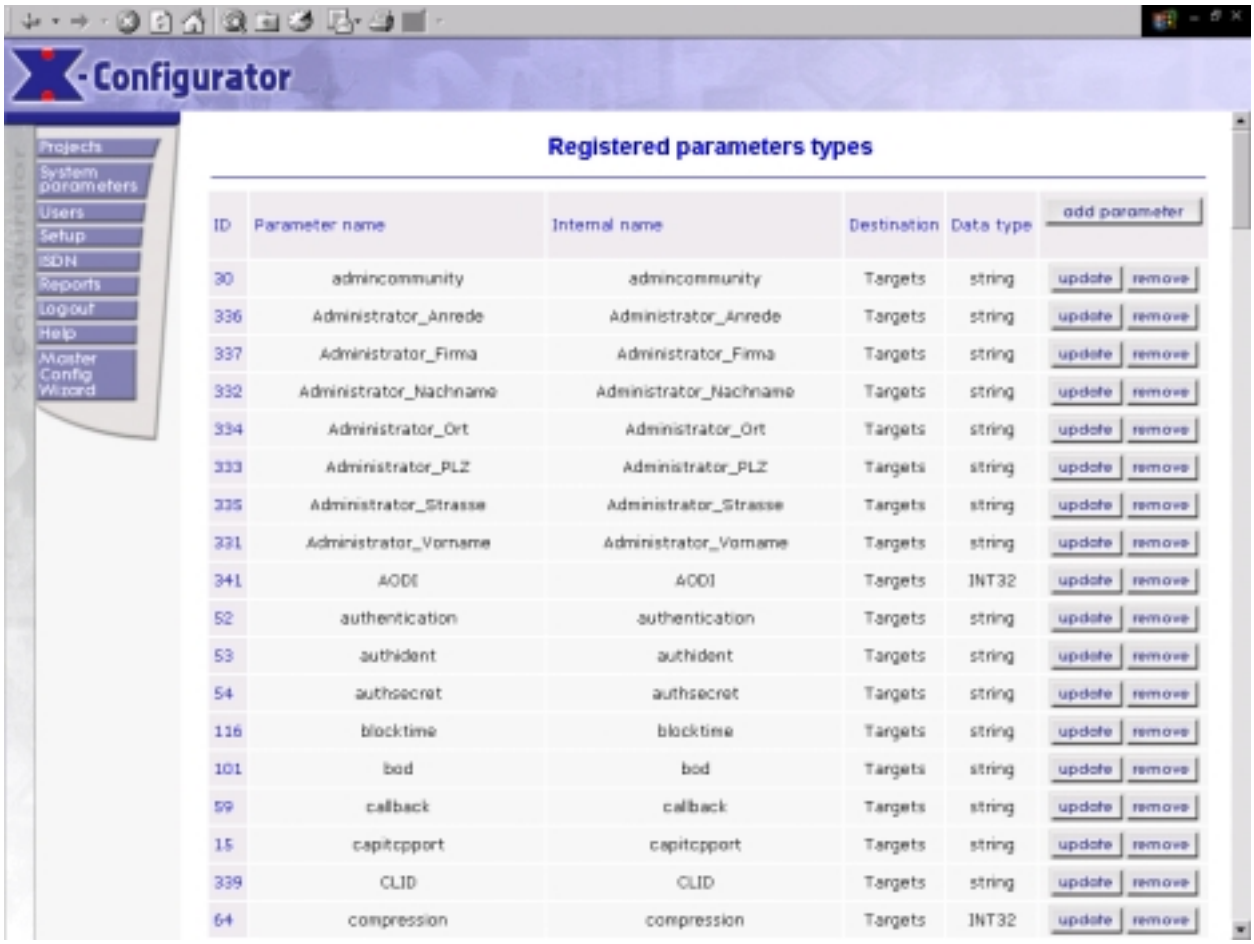

Configurator
Projects
System parameters
Users
Setup
ISDN
Reports
Logout
Help
Master Config Wizard
Registered parameters types
ID
Parameter name
Internal name
Destination
Data type
add parameter
30 admincommunity admincommunity Targets string update remove
336 Administrator_Anrede Administrator_Anrede Targets string update remove
337 Administrator_Firma Administrator_Firma Targets string update remove
332 Administrator_Nachname Administrator_Nachname Targets string update remove
334 Administrator_Ort Administrator_Ort Targets string update remove
333 Administrator_PLZ Administrator_PLZ Targets string update remove
335 Administrator_Strasse Administrator_Strasse Targets string update remove
331 Administrator_Vorname Administrator_Vorname Targets string update remove
341 AODI AODI Targets INT32 update remove
52 authentication authentication Targets string update remove
53 authident authident Targets string update remove
54 authsecret authsecret Targets string update remove
116 blocktime blocktime Targets string update remove
101 bod bod Targets string update remove
59 callback callback Targets string update remove
15 capitcpport capitcpport Targets string update remove
339 CLID CLID Targets string update remove
64 compression compression Targets INT32 update remove

Figure 23 The sample view in “System parameters“ option of X-Configurator

6.2.1. Project parameters

This option is available in the System Parameters section of the X-Configurator. Here you can set up parameters describing project. The LUA script job files of the X-Configurator can use parameters configured here. If there are any configured project parameters, you will see them on the list of registered parameter types (see figure 23).

6.2.1.1. Add Parameter

Click on **Add parameter** option to create and configure new parameter that can be used later in the project. The LUA script can use this parameter. When you choose this option a new view will appear (see figure 24) with the following fields:

- *Name* - enter the description string for the new created parameter.
- *Short name* - enter the short name of the parameter that will be configured. This name is important and is used in the X-Configurator job scripts. The button **Copy from "Name"** allows you to copy the name of the parameter from *Name* field.
- *Data type* - this field allows you to set up the type of the parameter. You can choose between:

1) Byte - select this type if the parameter represents the small positive integer number (0-255).

2) INT16 - select this type the parameter represents 16-bits integer number.

3) INT32 - select this type the parameter represents 32-bits integer number.

4) String - select this type if the parameter represents text (string).

5) IP Address - select this type if the parameter represents IP address. For example: IP network mask.

6) Password - select this type if the parameter represents password. For security reasons such parameters should be encrypted and invisible for everyone.

7) Version - select this type if the parameter represents version. For example: firmware (software) version.

8) Date time - select this type if the parameter represents date and time.

- *Parameter destination* - here you can define where this parameter can be used. You can choose and apply this parameter in:
  1) Projects – select this option if this parameter will be used in project.

  2) NAS configuration – select this option if this parameter will be used in configuration of NAS.

  3) Target configuration – select this option if this parameter will be used in configuration of target.
- *Language* - here you can choose a language which describes the parameter. You enter the description in the *Quick Info* field.
- *Value* - when parameter is enumerate type you can associate values of this parameter with any description name, entered in *Value name* field. In this way you can create the pairs containing *value name=value*.
- *Value name* – input here description name for the value of parameter when the parameter is enumerate type. **Add** button allows you to add pair *value name=value* to the list and **Remove** button allows you to remove the selected pair from the list.
- *Is array* - mark this option when the parameter is an array of values (i.e. array of numbers, array of strings).
- *Writable* - mark this option when the parameter can be written to database by the job script.
- *Readonly* - mark this option when the parameter should only be read by the X-Configurator.
- *Hidden* - mark this option when the parameter has to be invisible for the user operating in the X-Configurator.
- *Mandatory* - mark this option when the parameter have to be configured in every project.
- *Quick info* - you can enter here some usefully information about this parameter. The Information is displayed in a language selected in *Language* field.

When you fill in all the fields you can add parameter to the database by clicking on **Apply** button. If you want to abort or cancel the operation, click **Back**.

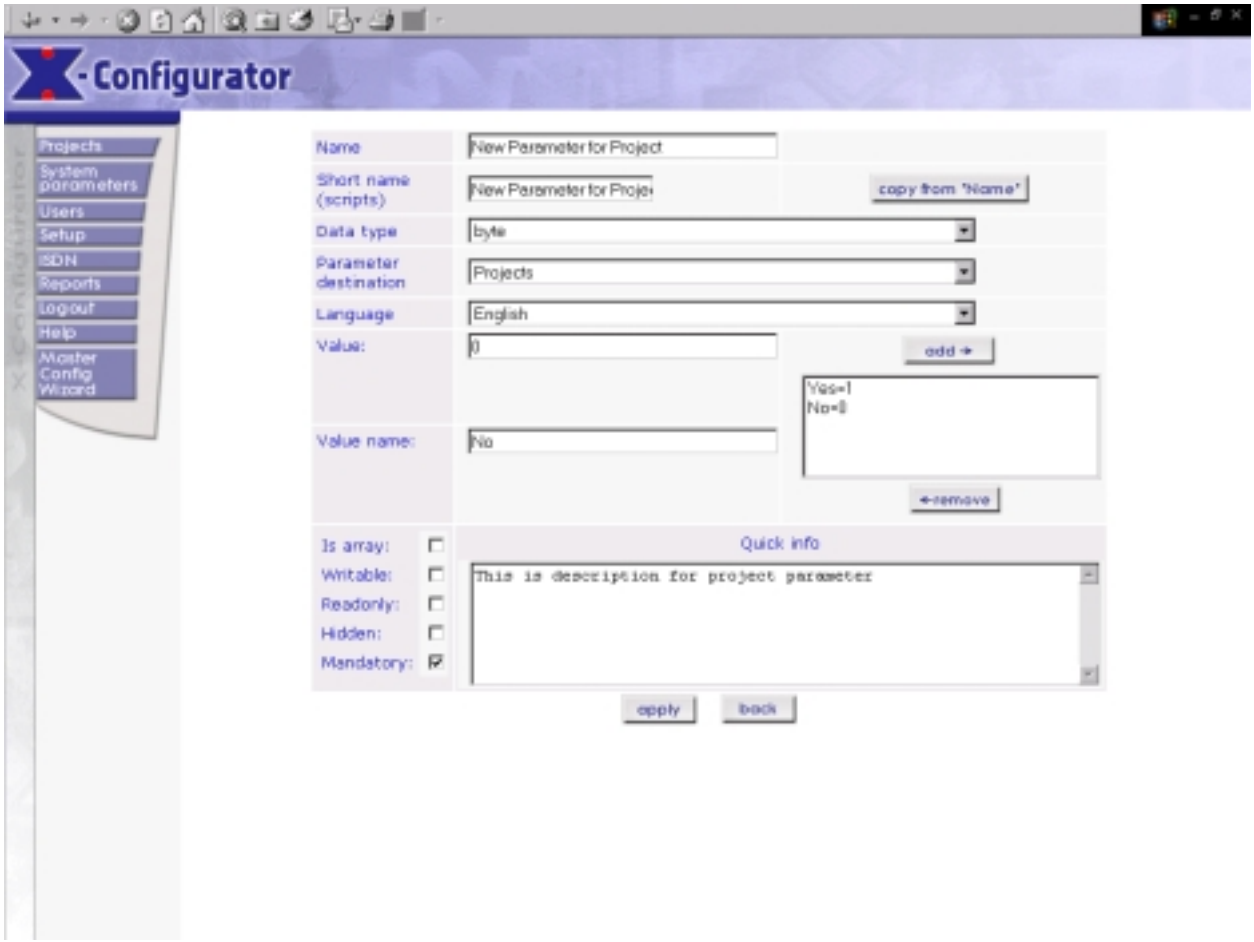


Figure 24 The view in “Add parameter for project“ option

6.2.1.2. Update Parameter

Click on the **Update** button located next to the selected parameter. New window will appear with the fields with the same meaning as described in Add parameter option. When you have changed desired field, click **Apply** to save changes in the database or click **Back** to abort or cancel edition.

6.2.1.3. Remove Parameter

Click on the **Remove** button located next to the selected parameter name. The parameter will be deleted from the database.

6.2.2. NAS parameters

This option is available in the System Parameters section of the X-Configurator. Here you can set up parameters that describe the router in central site and optionally the central radius server. All the devices are called NAS. Parameters configured here can be used by the LUA script jobs files of the X-Configurator. If there are any configured NAS parameters, you will see them on the list of registered parameter types (see figure 23).

6.2.2.1. Add Parameter

Click on **Add parameter** option to create and configure new parameter that can be used later in configuration process. This parameter can be used by the LUA job script. When you choose this option a new view will appear (see figure 25) with the following fields:

- *Name* - enter the description string for the new created NAS parameter.
- *Short name* - enter the short name of the parameter that will be configured. This name is important and is used in the X-Configurator job scripts. The button **Copy from "Name"** allows you to copy the name of the parameter from *Name* field.
- *Data type* - this field allows you to set up the type of the parameter. You can choose between:
  1) Byte - select this type if the parameter represents the small positive integer number (0-255).
  2) INT16 - select this type the parameter represents 16-bits integer number.
  3) INT32 - select this type the parameter represents 32-bits integer number.
  4) String - select this type if the parameter represents text (string).
  5) IP Address - select this type if the parameter represents IP address. For example: IP network mask.
  6) Password - select this type if the parameter represents password. For security reasons such parameters should be encrypted and invisible for everyone.
  7) Version - select this type if the parameter represents version. For example: firmware (software) version.
  8) Date time - select this type if the parameter represents date and time.
- *Parameter destination* - here you can define where this parameter can be used. You can choose and apply this parameter in:
  1) Projects – select this option if this parameter will be used in project.
  2) NAS configuration – select this option if this parameter will be used in configuration of NAS.
  3) Target configuration – select this option if this parameter will be used in configuration of target.
- *Language* - here you can choose a language which describes the parameter. You enter the description in the *Quick Info* field.
- *Value* - when parameter is enumerate type you can associate values of this parameter with any description name, entered in *Value name* field. In this way you can create the pairs containing *value name*=*value*.

- *Value name* – input here description name for the value of parameter when the parameter is enumerate type. **Add** button allows you to add pair *value name=value* to the list and **Remove** button allows you to remove the selected pair from the list.
- *Is array* - mark this option when the parameter is an array of values (i.e. array of numbers, array of strings).
- *Writable* - mark this option when the parameter can be written to database by the job script.
- *Readonly* - mark this option when the parameter should only be read by the X-Configurator.
- *Hidden* - mark this option when the parameter has to be invisible for the user operating in the X-Configurator.
- *Mandatory* - mark this option when the parameter have to be configured in every NAS.
- *Quick info* - you can enter here some usefully information about this parameter. The Information is displayed in a language selected in *Language* field.

When you fill in all the fields you can add parameter to the database by clicking **Apply** button. If you want to abort or cancel the operation, click **Back**.

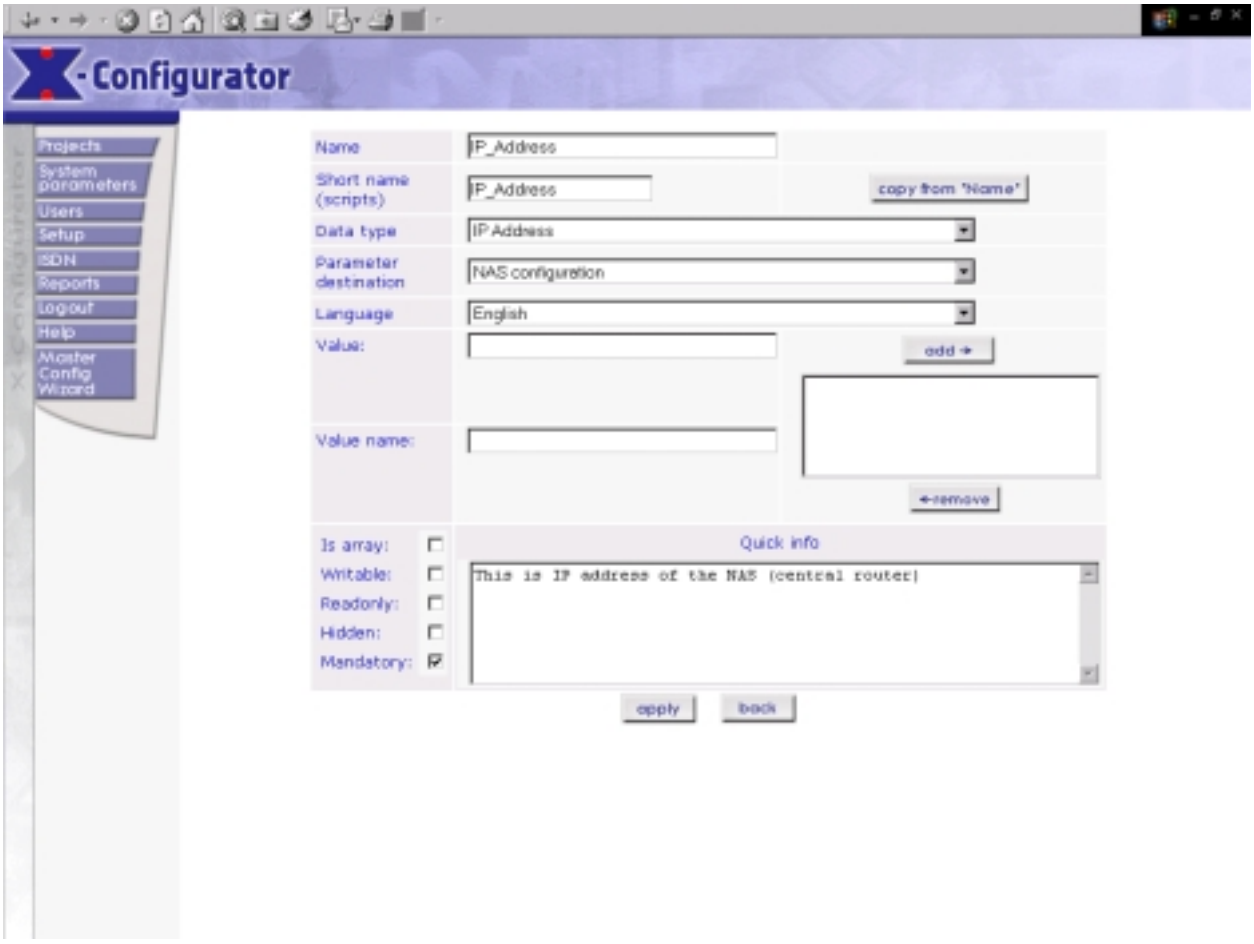


Figure 25 The view in “Add parameter for NAS“ option

6.2.2.2. Update Parameter

Click on **Update** button located next to the selected parameter. A new window will appear with the fields with the same meaning as described in Add parameter for NAS option. When you have changed the desired field, click **Apply** to save changes in the database or click **Back** to abort or cancel the edition.

6.2.2.3. Remove Parameter

Click on **Remove** button located next to the selected NAS parameter to delete. After this the NAS parameter will be deleted from the database.

6.2.3. Target parameters

This option is available in the System Parameters section of the X-Configurator. Here you can configure parameters that will be configured on the targets (routers). Parameters configured here can be used by the LUA jobs files of the X-Configurator. If there are any configured target parameters, you will see them on the list of registered parameter types (see figure 23).

6.2.3.1. Add Parameter

Click on **Add parameter** option to create and configure new parameter that can be used later in configuration process of the target. When you choose this option new view will appear (see figure 26) with the following fields:

- *Name* - enter the description string for the new created target parameter.
- *Short name* - enter the short name of the parameter that will be configured. This name is important and is used in the X-Configurator job scripts. The button **Copy from "Name"** allows you to copy the name of the parameter from *Name* field.
- *Data type* - this field allows you to set up the type of the parameter. You can choose between:
  1) Byte - select this type if the parameter represents the small positive integer number (0-255).
  2) INT16 - select this type the parameter represents 16-bits integer number.
  3) INT32 - select this type the parameter represents 32-bits integer number.
  4) String - select this type if the parameter represents text (string).
  5) IP Address - select this type if the parameter represents IP address. For example: IP network mask.
  6) Password - select this type if the parameter represents password. For security reasons such parameters should be encrypted and invisible for everyone.

7) Version - select this type if the parameter represents version. For example: firmware (software) version.

8) Date time - select this type if the parameter represents date and time.

- *Parameter destination* - here you can define where this parameter can be used. You can choose and apply this parameter in:
  1) Projects – select this option if this parameter will be used in project.

  2) NAS configuration – select this option if this parameter will be used in configuration of NAS.

  3) Target configuration – select this option if this parameter will be used in configuration of target.
- *Language* - here you can choose a language which describes the parameter. You enter the description in the *Quick Info* field.
- *Value* - when parameter is enumerate type you can associate values of this parameter with any description name, entered in *Value name* field. In this way you can create the pairs containing *value name=value*.
- *Value name* – input here description name for the value of parameter when the parameter is enumerate type. **Add** button allows you to add pair *value name=value* to the list and **Remove** button allows you to remove the selected pair from the list.
- *Is array* - mark this option when the parameter is an array of values (i.e. array of numbers, array of strings).
- *Writable* - mark this option when the parameter can be written to database by the job script.
- *Readonly* - mark this option when the parameter should only be read by the X-Configurator.
- *Hidden* - mark this option when the parameter has to be invisible for the user operating in the X-Configurator.
- *Mandatory* - mark this option when the parameter have to be configured on every target.
- *Quick info* - you can enter here some usefully information about this parameter. The Information is displayed in a language selected in *Language* field.

When you fill in all the fields you can add parameter to the database by clicking **Apply** button. If you want to abort or cancel the operation, click **Back**.

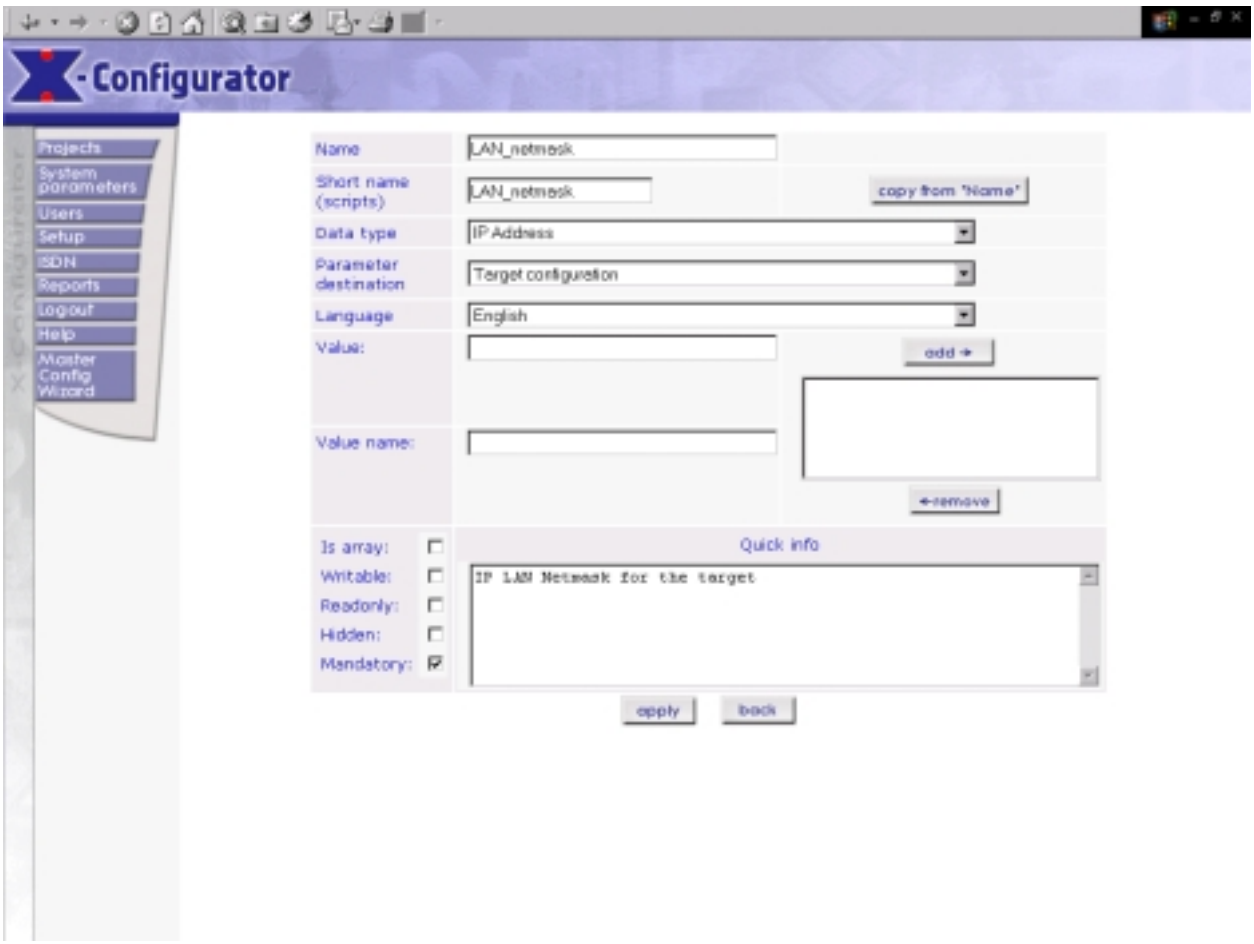


Figure 26 The view in “Add parameter for target“ option

6.2.3.2. Update Parameter

Click on the **Update** button located next to the selected parameter. A new window will appear with the fields with the same meaning as described in Add parameter option. When you have changed the desired field, click **Apply** to save changes in the database or **Back** to abort or cancel the edition.

6.2.3.3. Remove Parameter

Click on the **Remove** button located next to the selected parameter to delete this target parameter from the database.

6.3. Users

This option is available in the main menu of the X-Configurator. When you choose this option the new view (see figure 27) displays all defined users. It contains the following information:

- *Id* - displays unique identifier of the user in the database.
- *Login name* - Login name for the user, used for logging into X-Configurator.
- *Full name* - Full name of the user (i.e. first name and last name of the user).

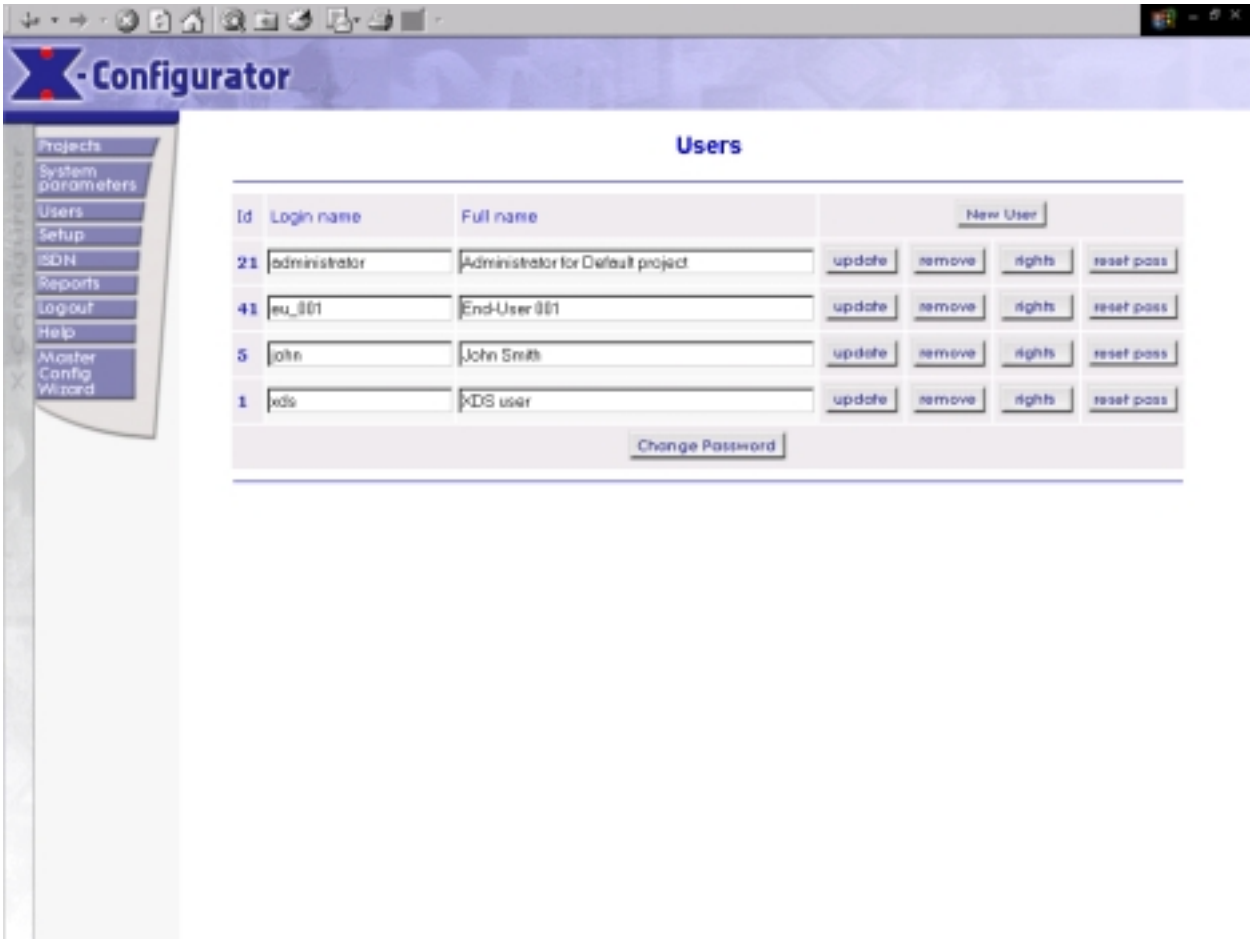


Figure 27 The sample view in "Users“ option of X-Configurator

6.3.1. New User

Click on **New user** if you want to create a new user. If you choose this option new window will appear for you to enter the following information:

- *Login name* - Login name for the user. With this string user will be able to log into X-Configurator and operate.
- *Full name* – optionally description of the new created user. This can be his first name and last name.
- *Password* - password that will be used together with login name when logging into X-Configurator. Password is encrypted using MD5 algorithm.

By default every new created user gets a default set of rights. You can grant rights for any user using option Rights from Users options.

Click **Save** to save the setting and add new user to the database.

Note:
During login process values for: *Login name* and *Password* are case sensitive.

6.3.2. Update User

You can modify parameters of existing users in User window. To modify selected user, make changes in appropriate fields and click on the **Update** button next to the modified field.

6.3.3. Remove User

You can delete existing users listed in User window. To delete particular user from the list, click on the **Remove** button next to the selected user. He selected user will be deleted from the database.

6.3.4. User Rights

This window (see figure 28) allows you to assign or change the rights of the selected user. Each of user's rights gives the user access to particular option(s) of the X-Configurator:

- *Projects* – grant access to the Projects option.
- *User* – grant access to the Users option.
- *Profiles* – grant access to the Profiles option.
- *Setup* - grant access to the Setup option.
- *Target* - grant access to the Targets option.
- *Task* - grant access to the Tasks Template option.
- *Job* - grant access to the Jobs option.
- *Report* - grant access to the Reports option.
- *Log* - grant access to the XACS Log option.
- *NAS* - grant access to the NAS option.

You can assign the following rights to the user that apply to particular option of the X-Configurator:

- *None* - if this checkbox is marked, user has no rights to access this option of the X-Configurator.
- *Read* - if this checkbox is marked, user has right to read (view) information from this option of the X-Configurator.
- *Create* - if this checkbox is marked, user has right to create new objects (i.e. project, user, task) in particular option of the X-Configurator (i.e. Projects, Users, Report).

- *Change* - if this checkbox is marked, user has right to change properties for this object (i.e. project, user, task) in particular option of the X-Configurator (i.e. Projects, Users, Setup).
- *Delete* - if this checkbox is marked, user has right to delete object (i.e. project, user, task) in particular option of the X-Configurator (i.e. Projects, Users, Job).
- *Execute* - if this checkbox is marked, user has right to execute object (starting a task) in the "Task" option of the X-Configurator.
- *Admin* - if this checkbox is marked, user has administrative rights for the object (i.e. project, user, task) in particular option of the X-Configurator (i.e. Projects, Users, Job).

Click **Save** to write the user's settings in the database.

Note:

1. The rights apply to the project selected in the drop-down menu on the right side of the window. This allows you to view the user's rights for "Profiles" option, for example in ProjectNo1 and the rights for option "Job" in ProjectNo2 at once. When you select any project name from drop-down menu, click **Refresh rights** to make sure that rights displayed on the screen are correct.
2. By default new created users has default set of rights, so you will need to assign the additionally rights for them. Additionally you need to have the rights to be able to create and modify the Users option in the X-Configurator.

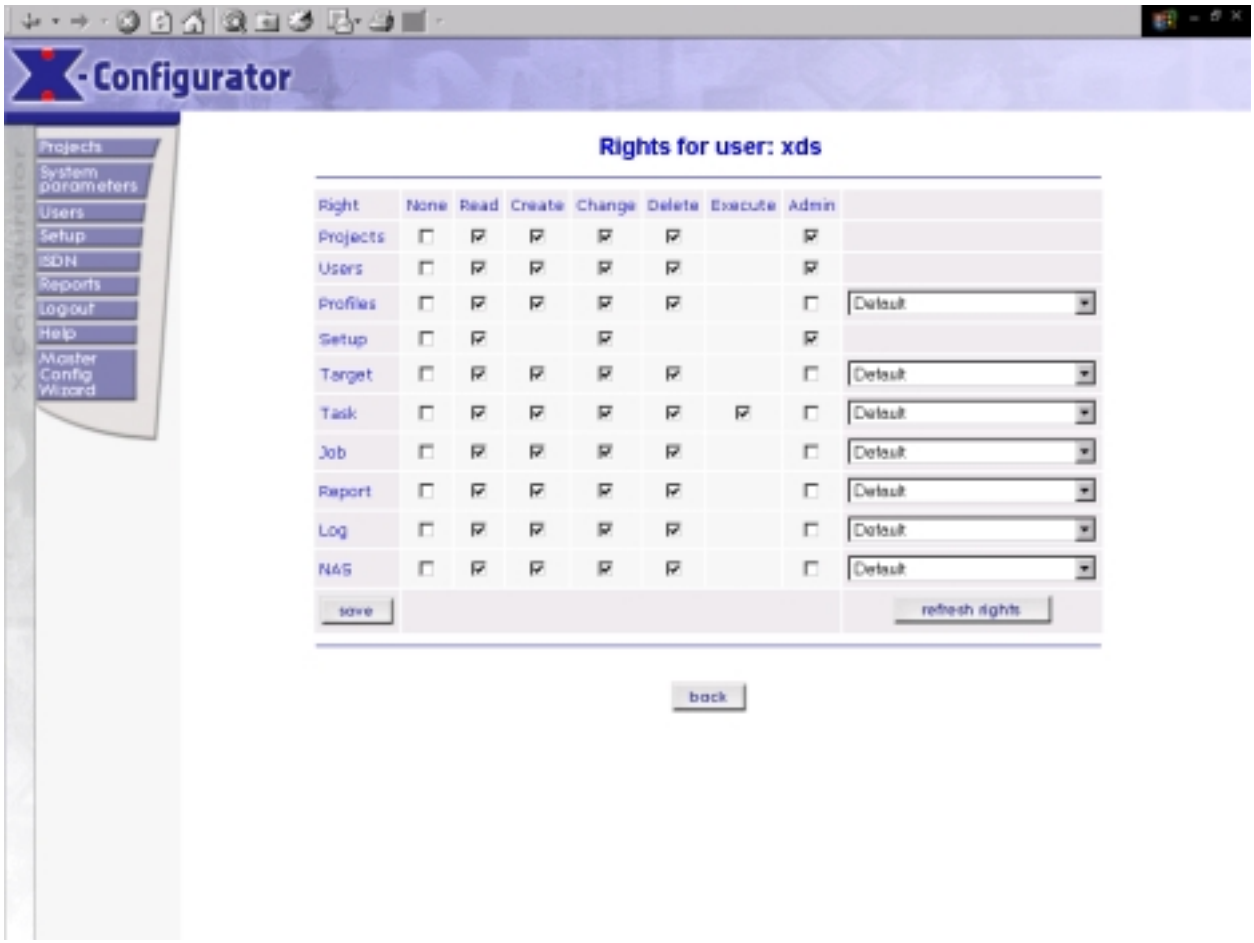


Figure 28 The sample view with user's rights for user "xds" in "Rights" option

6.3.5. Change Password

Click on **Change password** button if you want to change the password for the current user logged in the X-Configurator. When you choose this option the new window will appear. Type in the old password in the *Old password* field and then the new password in the *New password* field. Click on **Change** button to confirm changes.

The change takes effect once a user logs out from the X-Configurator. You may use Logout option from the menu of the X-Configurator. You will have to type the new password when trying to log in the next time.

6.3.6. Reset Password

If you want to reset password for the selected user, click on the **Reset pass** button next to the login name. He will use empty password when logging to a system the next time. You can use Logout option from the menu of the X-Configurator to login once again with empty password.

6.4. Setup

In this option you can configure the X-Configurator parameters as well as parameters for others components. The view that you will see in this option is shown in figure 29.

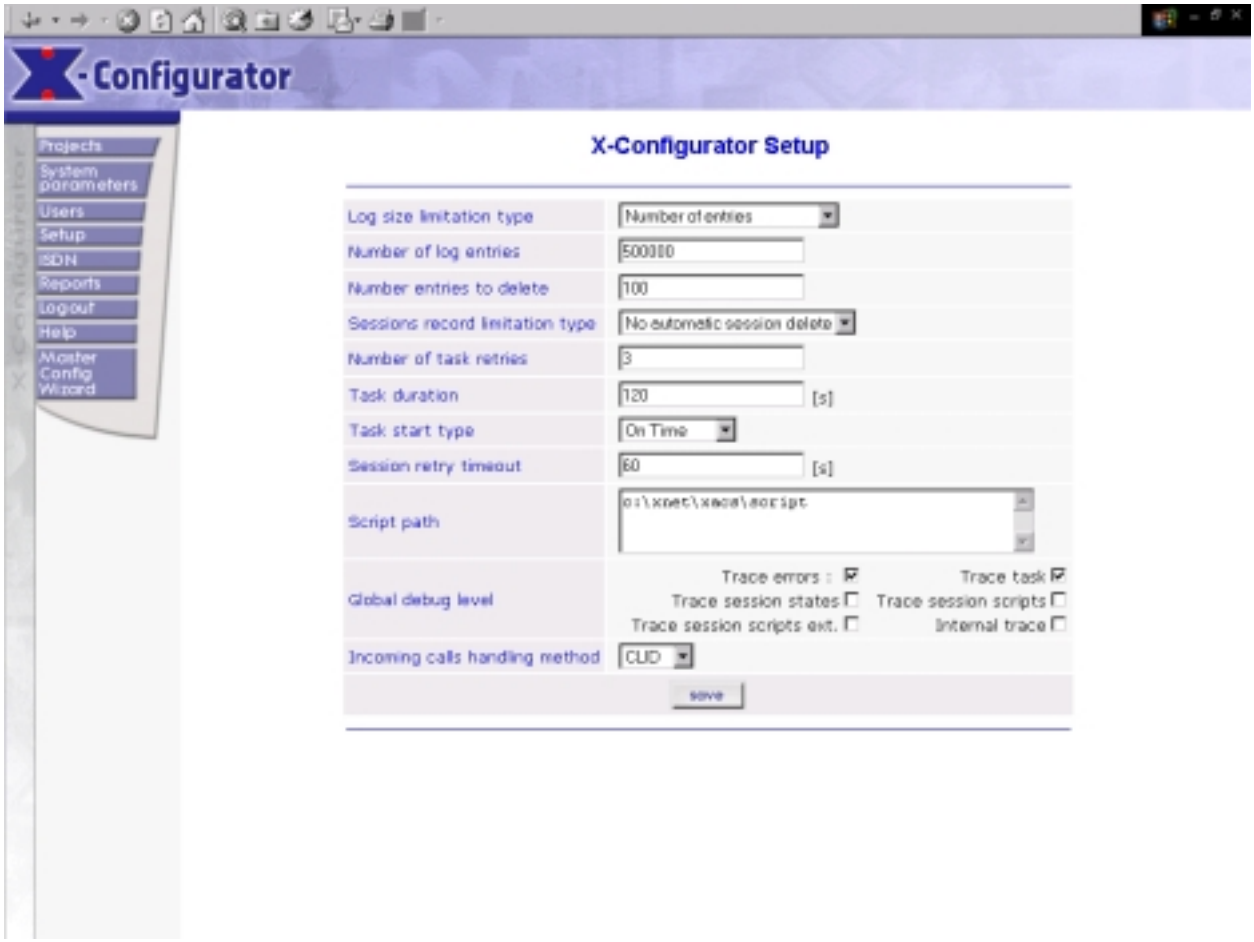


Figure 29 The view in “Setup“ option of X-Configurator

You can find here the following fields:

- *Log size limitation type* - This parameter says when the log file should be truncated. You can choose between:
  1) Number of entries - remove oldest log events when number of entries exceeds value set in *Number of log entries* field.
  2) Older than number of days - remove log entries older than date set in *Number of days to store log* field.
  3) No automatic log delete - do not remove log events automatically. In this case you can delete records manually.
- *Number of log entries* - (this field is shown if *Log size limitation type* = Number of entries). Log size is limited to this number of records.
- *Number of days to store log* - (this field is shown if *Log size limitation type* = Older than number of days). The number of days that log events are stored.

- *Number of entries to delete* - (field is shown if *Log size limitation type* = Number of entries, or *Log size limitation type* = Older than number of days). The number of entries that will be automatically deleted when log exceeds certain number of events or when events in log are older than number of days specified by user.
- *Sessions record limitation type* - This parameter says when the session log should be truncated. You can choose between:
  1) Number store sessions - remove oldest sessions when number of sessions exceeds the value set in *Number of session entries* field.
  2) Older than number of days - remove sessions older than the value set in *Number of days to store sessions* field.
  3) No automatic session delete - do not remove sessions automatically. In this case you can delete records manually.
- *Number of days to store sessions* - (this field is shown if: *Session record limitation type* = Older than number of days). This parameter describes how many days particular session should be stored in database.
- *Number of session entries* - (this field is shown if: *Session record limitation type* = Number store session). Number of sessions to be stored in database.
- *Number of entries to delete* - (field is shown if: *Session record limitation type* = Older than number of days or *Session record limitation type* = Number store session). Number of sessions removed in one truncate.
- *Number of task retries* - Default number of retries for a new task. This parameter says how many times task can be retried when an error has occurred during the execution. Enter here 0 (zero) if you don't want to retry.
- *Task duration* - Default time of task duration (given in seconds). For example: 360.
- *Task start type* - Default task start type. The X-Configurator offers the following task types:
  - On Time
  - Repeatable
  - On Call
  - On Event

  For more details see also sections Task start conditions and XACS Scheduler.
- *Session retry timeout* - Time is seconds the XACS Scheduler waits before retrying session to the target. For example: 80.
- *Script Path* - Set of directories, in which scheduler searches for LUA scripts to execute, when job's filename does not specify full path. Directories names should be separated with semicolon (';'). E.g.: ".;c:\xacs\script".
- *Global debug level* - Global debug level is used by the XACS Scheduler to mask its debug database output. Debug level for specified session is of this field OR target's debug level (configured in Targets option). To set debug level, you can OR the following values:
  - Errors 0x0001. Error trace. This is default value.
  - Task Trace 0x0002. Task instances creation and status change.
  - Session States Trace 0x0004. Session creation and status change.
  - Session Script Trace Basic 0x0008. Printouts from scripts.

- Session Script Trace Extended: 0x0010. Extended printouts from scripts.

- Internal Trace: 0x0100. Flag for highest level internal debug.

- *Identifier of the job used for incoming call handling* - Identifier of the job used for incoming call handling, when value in *Incoming calls handling method* field is “Active”.
- *Incoming calls handling method* - Values:
  1) CLID: Session is started, when Calling Number matches target’s telephone number.
  2) Active: When there is an incoming call, XACS Scheduler starts job, which is specified by the field *Identifier of the job used for incoming call handling*. This job calls Calling Number and makes ISDN session. It retrieves client’s unique identifier (e.g. serial number). Then scheduler starts configuration session to target, which matches unique identifier

For more details see also sections CLID method, Active method and XACS Scheduler.

Click on **Save** button if you have changed the value of any parameter and you want to keep the changes.

6.5. ISDN

This option enables you to configure ISDN communications parameters. This option contains the following sub-options:

- Controllers
- MSN

6.5.1. ISDN Controllers

This option allows you to create, modify or delete communications controllers. To perform any of those actions simply click on the appropriate button next to the chosen controller. Figure 30 shows a sample view in ISDN Controllers option.

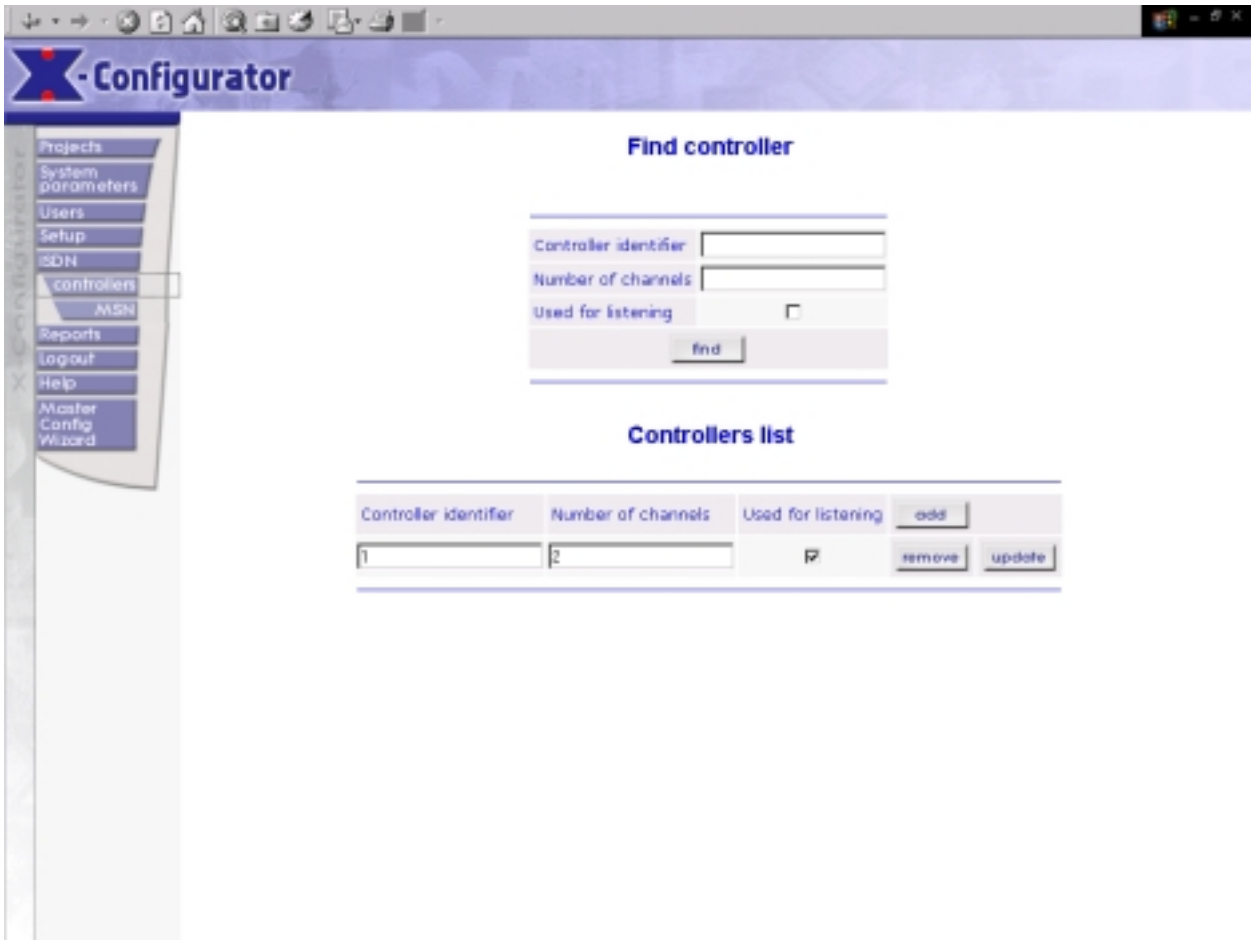


Figure 30 The view in “ISDN Controllers“ option of X-Configurator

6.5.1.1. Find Controller

In "Find controller" window you can quickly find desired controller. You can search for controllers using the following key properties (fields):

- *Controller identifier* - find controller with required identifier.
- *Number of channels* - find controller(s) with required number of channels.
- *Used for listening* - find controller(s) with this property.

When you input desired searching key, click on the **Find** button.

Note:
For these three fields function OR is used as a condition in controller searching. For example:

If you enter ‘3’ in *Controller identifier* field and you leave the *used for listening* checkbox unchecked, as a search result you will get the information about controller number 3 (if exists) and all controllers that have not marked *Used for listening* option.

6.5.1.2. Controller List

This window shows the list of all defined controllers. If option find have been used, the list will show all controllers that match search conditions. If no controller was found in search process or there are no defined controllers, the list will remain empty.

6.5.1.3. Add Controller

You can add new controller in "Controllers List" window. To add a new controller to the list press **Add** button. A new "Add controller" window will appear with the following fields:

- *Controller identifier* - input here numerical identifier for the new created controller.
- *Number of channels* - input here number of communications channels offered by this controller (device-router).
- *Used for listening* - check this box, if you wish to use this controller in listening mode (allows receiving the incoming calls). Otherwise the controller will only be able to make outgoing calls to the targets.

When you fill in all the fields click **Add** button to add a new controller to the list.

6.5.1.4. Remove Controller

You can remove existing controller in "Controllers List" window. To delete particular controller from the list, simply click on the **Remove** button next to the selected controller.

6.5.1.5. Update Controller

You can modify parameters of existing controller in “Controllers List” window. To modify a controller, first make desired changes in appropriate fields then click on the **Update** button next to the selected controller.

6.5.2. ISDN MSN

This option allows you to assign particular MSN numbers to selected controllers. When you choose this option the new view appears (see figure 31).

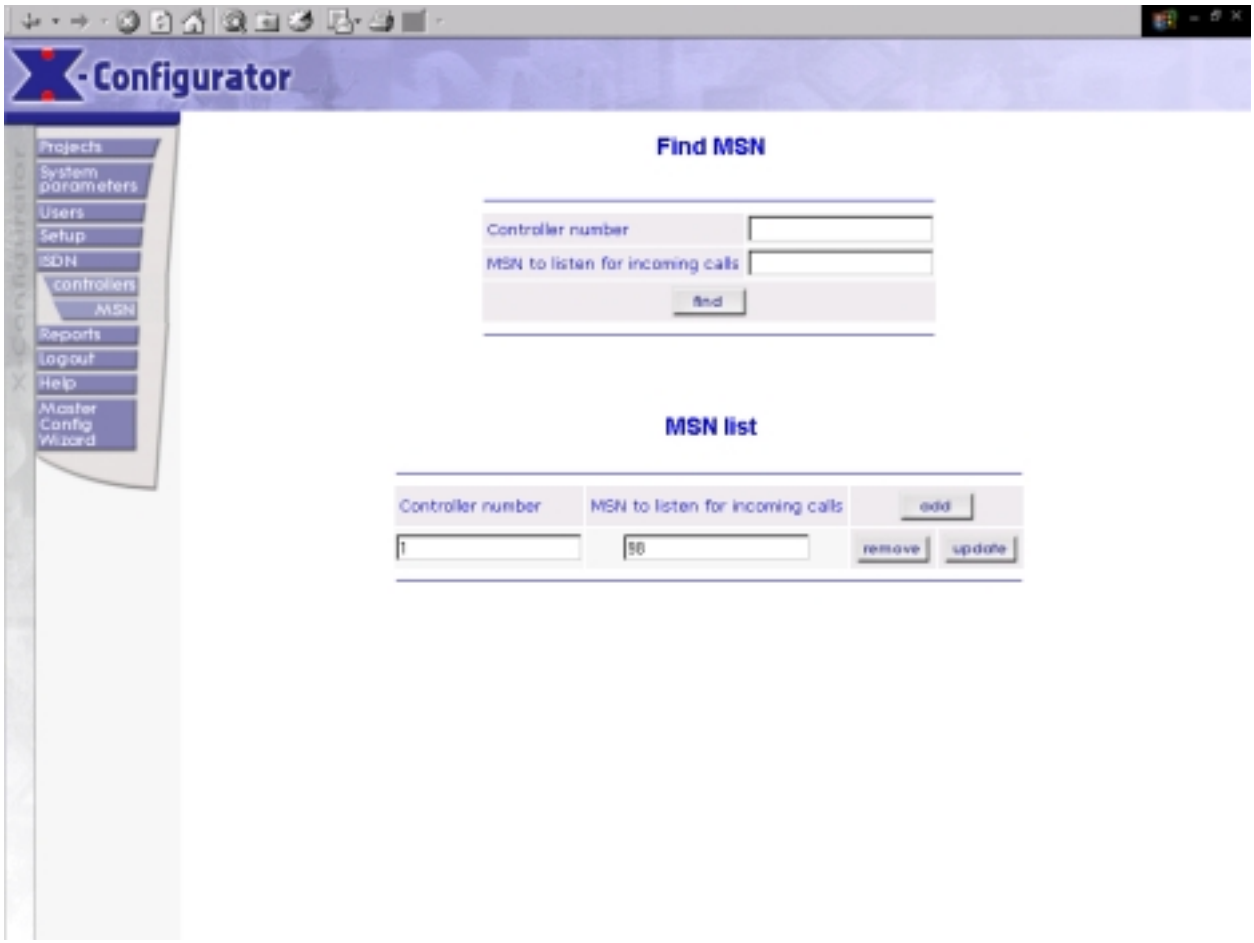


Figure 31 Sample view in “ISDN MSN“ option of X-Configurator

6.5.2.1. Find MSN

In "Find MSN" window you can quickly find desired controller. You can search for controllers using the following key properties (fields):

- *Controller number* – search for controller according to his identifier number.
- *MSN to listen to incoming calls* - find controller with desired MSN number used for listening to incoming calls.

When you input desired searching key, click on the **Find** button to begin search.

6.5.2.2. MSN List

This window displays all defined MSN's and assigned controllers or if you used **Find** option, this window shows controller that matches search pattern. If no controller found this window will be empty. One controller can have more than one MSN number.

6.5.2.3. Add MSN

You can add new MSN number in "MSN List" window. To add new MSN number to the list press **Add** button in the top right corner of the window. New "Add MSN" window will appear with the following fields:

- *Controller number* - input here controller identifier for which you want to assign MSN. Controller with this identifier must exists. Refer to section Add Controller for information about adding new controllers.
- *MSN to listen for incoming calls* - enter MSN number that will be associated with this controller. One controller may have more than one MSN number.

When you fill in all fields, click **Add** button to add a new MSN.

6.5.2.4. Remove MSN

You can remove existing MSN number listed in "MSN List" window. To delete MSN number from the list, click on the **Remove** button next to the selected MSN.

6.5.2.5. Update MSN

You can modify parameters of existing MSN numbers and associated controllers in “MSN List” window. To modify selected MSN number, first make desired changes in appropriate fields, then click **Update** button next to the changed MSN number.

6.6. Reports

This option is located in the main menu of the X-Configurator and allows you to create the reports from the sessions to the targets (routers). Reports contain particular messages from the XACS Log (for example for selected target, task).

6.6.1. Log

This option is located in Reports option of the X-Configurator and allows you to create reports based on the information stored in the XACS Log. When you choose this option Log Report Wizard appears.

In the first step you will select the columns that will be contained in the report. Please select here the required columns and press **Next**. You will go to the next step of the wizard.

In the second step of Log Report Wizard you select the filter that will extract messages from XACS Log with required property. The view in this option is similar to

the XACS Log option located in Projects option and therefore for more details please refer to the section that describes this option. After all press **Finish** button that ends the wizard procedure. The report will be listed in the new window. You can now print the report using Print option of your browser. Sample Log Report is shown in figure 32.

Note:

Displaying the report page may take some time when the XACS Log database is large.

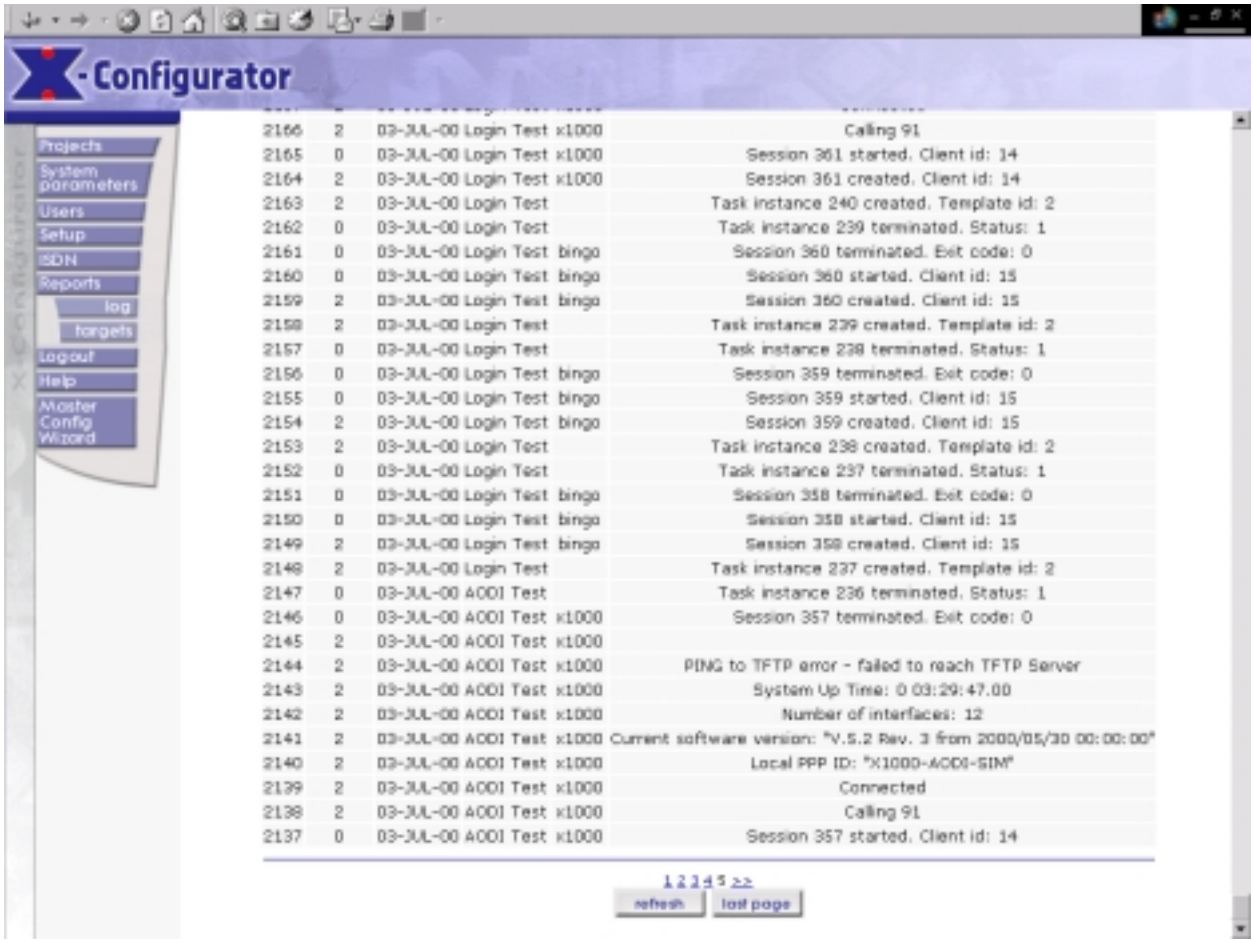

X-Configurator
Projects
System parameters
Users
Setup
ISDN
Reports
log
targets
Logout
Help
Master Config Wizard
2166 2 03-JUL-00 Login Test x1000 Calling 91
2165 0 03-JUL-00 Login Test x1000 Session 361 started. Client id: 14
2164 2 03-JUL-00 Login Test x1000 Session 361 created. Client id: 14
2163 2 03-JUL-00 Login Test Task instance 240 created. Template id: 2
2162 0 03-JUL-00 Login Test Task instance 239 terminated. Status: 1
2161 0 03-JUL-00 Login Test bingo Session 360 terminated. Exit code: 0
2160 0 03-JUL-00 Login Test bingo Session 360 started. Client id: 15
2159 2 03-JUL-00 Login Test bingo Session 360 created. Client id: 15
2158 2 03-JUL-00 Login Test Task instance 239 created. Template id: 2
2157 0 03-JUL-00 Login Test Task instance 238 terminated. Status: 1
2156 0 03-JUL-00 Login Test bingo Session 359 terminated. Exit code: 0
2155 0 03-JUL-00 Login Test bingo Session 359 started. Client id: 15
2154 2 03-JUL-00 Login Test bingo Session 359 created. Client id: 15
2153 2 03-JUL-00 Login Test Task instance 238 created. Template id: 2
2152 0 03-JUL-00 Login Test Task instance 237 terminated. Status: 1
2151 0 03-JUL-00 Login Test bingo Session 358 terminated. Exit code: 0
2150 0 03-JUL-00 Login Test bingo Session 358 started. Client id: 15
2149 2 03-JUL-00 Login Test bingo Session 358 created. Client id: 15
2148 2 03-JUL-00 Login Test Task instance 237 created. Template id: 2
2147 0 03-JUL-00 ACOI Test Task instance 236 terminated. Status: 1
2146 0 03-JUL-00 ACOI Test x1000 Session 357 terminated. Exit code: 0
2145 2 03-JUL-00 ACOI Test x1000
2144 2 03-JUL-00 ACOI Test x1000 PING to TFTP error - failed to reach TFTP Server
2143 2 03-JUL-00 ACOI Test x1000 System Up Time: 0 03:29:47.00
2142 2 03-JUL-00 ACOI Test x1000 Number of interfaces: 12
2141 2 03-JUL-00 ACOI Test x1000 Current software version: "V.5.2 Rev. 3 from 2000/05/30 00:00:00"
2140 2 03-JUL-00 ACOI Test x1000 Local PPP ID: "X1000-ACOI-SIM"
2139 2 03-JUL-00 ACOI Test x1000 Connected
2138 2 03-JUL-00 ACOI Test x1000 Calling 91
2137 0 03-JUL-00 ACOI Test x1000 Session 357 started. Client id: 14
1 2 3 4 5 >>
refresh
last page

Figure 32 The sample Log Report created in “Reports Log“ option of X-Configurator

6.6.2. Targets

This option allows you to create reports for particular target.

6.7. Help

This option the X-Configurator enables quick access to the X-Configurator Help. The X-Configurator Help contains a detailed description of each option of the X-Configurator. Additionally, you can use the search engine that helps you to find document according to the entered topic.

Search engine is located on the top of the page and allows you to input any string that should be find. For example if you want to search documents that describe Task Manager option simply input *Task Manager* in the search field and press **Search** button. The search engine is not case sensitive.

Help Index button located in the left menu allows you quickly jump to the contents of the X-Configurator Help.

Figure 33 shows a view of X-Configurator Help.

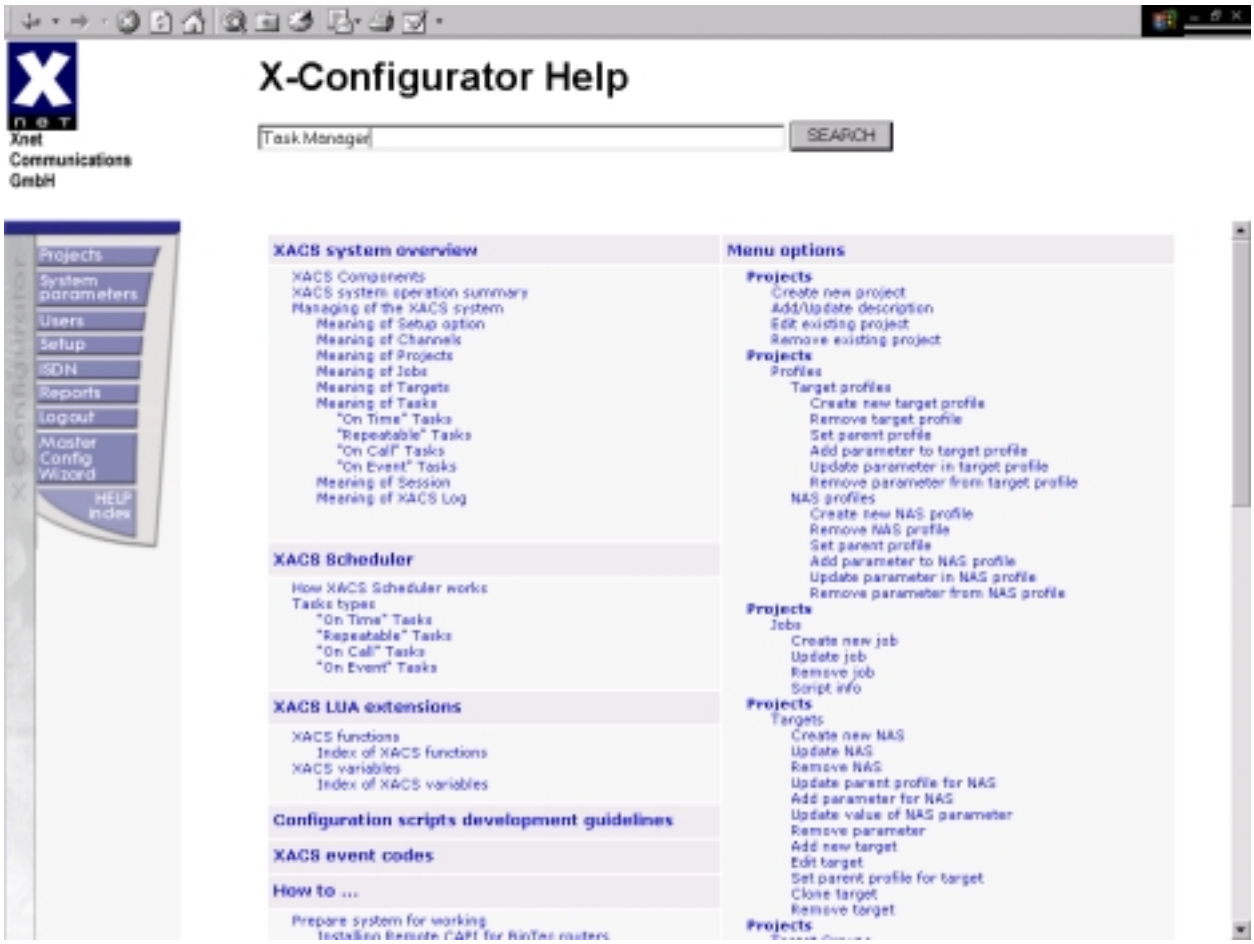


Figure 33 The main view in “Help“ option of X-Configurator Help

6.8. Logout

This option allows you to log out from the X-Configurator. You should use this option when you finish working with the X-Configurator or you want to login into the X-

Configurator as other user (with other user rights). When you choose this option the new window will appear with prompt to enter *User* and *Password*.

Note:
During log in, values in the fields *User* and *Password* are case sensitive.

Chapter 7 – Appendix

7.1. XACS event codes

The table below lists currently defined XACS error codes. These values are used in the XACS Log and session log. You can use these names in the LUA scripts. For example at the end of the script you can return error_code XACS_SUCCESS that means script has been successfully executed and doesn‘t matter what happened before this in the job file (maybe connection to target failed).

Predefined name	Value	Description
XACS_SUCCESS	0	Success
XACS_SCRIPT_TRACE	1	Script trace
XACS_DATABASE_ACCESS_ERROR	2	Database access error
XACS_CONFIG_READ_ERROR	3	Error reading setup data
XACS_RUN_SCRIPT_ERROR	4	Error running script file
XACS_SCRIPT_INIT_ERROR	5	Error initializing script engine
XACS_SCRIPT_INTERRUPTED	6	Session interrupted
XACS_SCRIPT_DEADLINE_REACHED	7	Deadline reached - session terminated by scheduler
XACS_CREATE_TASK_ERROR	8	Error creating task instance
XACS_CREATE_SESSION_ERROR	9	Error creating session
XACS_UPDATE_TASK_ERROR	10	Error update task instance status
XACS_UPDATE_SESSION_ERROR	11	Error update session status
XACS_NO_MATCHING_CLIENT_FOUND	12	No client matches event condition
XACS_ERROR_IN_EVENT_EXPRESSION	13	Error in event condition expression
XACS_MISCELEANOUS_ERROR	14	Miscellaneous error
XACS_CRON_STRING_PARSE_ERROR	15	Error parsing cron string
XACS_CRON_STRING_EMPTY	16	Time conditions not specified for repeatable task
XACS_CONNECTING_STARTED	17	Connection establishment started
XACS_CONNECTION_ESTABLISHED	18	Online
XACS_CONNECTION_FAILED	19	Connection failed
XACS_LOGIN_FAILURE	20	Login failure
XACS_CONNECTION_TERMINATED	21	Connection terminated
XACS_OPEN_SCRIPT_ERROR	22	Cannot open script file
XACS_CLIENT_READ_ERROR	23	Error reading client record
XACS_MODULE_INTERNAL_ERROR	24	Internal error
XACS_SERVICE_STARTED	25	Service started
XACS_SERVICE_FINISHED	26	Service stopped
XACS_NO_MEMORY	27	Not enough memory

7.2. Index of XACS LUA functions and XACS LUA variables

Index of the XACS LUA functions	Index of the XACS LUA variables
com_accept()	ARGC
com_reject(number)	ARGV
com_connect(string)	com_CIPMask
com_disconnect()	com_CIPValue
com_isdn_lastcause()	com_ISDN_B1
com_lasterror()	com_ISDN_B2
com_listen()	com_ISDN_B3
com_readtimeout()	com_ISDN_Calling_Number
com_receive(delimiterstring, timeout)	com_ISDN_ctrl_connect
com_receivebuf(number, timeout)	com_ISDN_ctrl_listen
com_receiveline()	com_device
com_send(string)	
com_sendfile(local [, remote])	
com_receive_file(remote, local)	
hex2str(string)	
include_file(string)	
system(string)	
write_dbg(string)	
write_log(EventCode, Severity, Message, DebugLevel)	

Chapter 8 – Troubleshooting

Problem: It takes a long time for a page to be displayed (i.e. XACS Log) in my browser and a loaded page is incomplete. Missing information on the page.

Solution: This may happen when default settings for maximum memory used by one page in PHP3 and timeout parameters are too small in your PHP3.INI file. You should change the values of the following parameters: max_execution_time, memory_limit. These parameters should have at least the following settings:

max_execution_time=300 ; set time on 300 seconds
memory_limit=20971520 ; set amount of consumed memory to 20 MB

Problem: You are in Setup option of the X-Configurator and cannot change anything.

Solution: You don't have the rights to modify this option. You can log into X-Configurator as other user or ask the admin to give you the appropriate rights.

Problem: I can't see all options in the left menu of the X-Configurator. When I log in, Task Manager window appears.

Solution: You don't have the user right "Admin". Only users with the "admin" have access to all options of the X-Configurator.

Problem: I can't see information about task and sessions execution in the XACS Log and sessions log even though the task was started.

Solution: Check if you have setup the appropriate debug level for the target(s) included in the task template.

Problem: I see the message: "Connection failed. Last error: 0 Result: Call/Answer error. Code: Timeout CAPI code: 0" in session log for the task.

Solution: Make sure that in ISDN option of the X-Configurator you have configured at least one controller(s) with identifier 1 and have assigned MSN number for it. For more information please refer to section Installing Remote CAPI for Bintec routers and Configuring ISDN channels for using by X-Configurator.

Problem: I have installed Remote CAPI, XACS Scheduler is started but configuration process cannot be started.

Solution: After installing Remote CAPI you must change properties for XACS Scheduler service. To do this, open Control Panel window and then Services. From the services list select XACS Scheduler and press Startup button. Set up “Log On As” option to “This Account”. Now enter appropriate account name and password. Now log on as different user if necessary and restart XACS Scheduler service. For more information please refer to section Installing Remote CAPI for Bintec routers.

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